TAILORING SERVICES TO PROMOTE FAMILY ECONOMIC SELF-SUFFICIENCY AND CONTINUED ENROLLMENT IN MATERNAL AND EARLY CHILDHOOD HOME VISITING PROGRAMS

by

Amanda K. Gatewood

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Abstract

Objectives: Many families and young children enrolled in home visiting (HV) experience health and social benefits, but HV programs often have difficulty retaining families in services. HV provides services to diverse families, but little is known about how services vary based on family needs. The goal of this study was to investigate the association of participation in the Temporary Assistance for Needy Families (TANF) program and receipt of economic self-sufficiency (ESS) services with duration of enrollment in HV.

Methods: A retrospective cohort study assessed duration of enrollment up to one year for expectant women and mothers with a child under three years old who enrolled in Healthy Families New Jersey in 2014-2015. Survival analyses tested the association of 1) participation in TANF with duration of enrollment in HV; 2) participation in TANF with the receipt of ESS services; and 3) receipt of ESS services with duration of enrollment. Models were clustered by site, adjusted for demographic characteristics, and stratified by TANF participation.

Results: Among the 2,779 enrolled families, 856 (31%) families participated in TANF. The average duration of enrollment was 175 days for families participating in TANF and 216 days for non-participating families ($p<0.001$). After adjusting for covariates, there was no association between TANF participation and duration of enrollment in HV ($p=0.90$). Less than one-third of families received ESS services in their first three months of enrollment, and only half of families received ESS services even after one year of enrollment. There was no difference in the rate of ESS service receipt when comparing TANF participants to non-participants ($p=0.47$). Families who received ESS services remained enrolled in HV for nearly three weeks longer than those who did not receive ESS services (235.8 vs. 214.4 days,

$p<0.001$). However, ESS service receipt was not associated with a larger effect on TANF participants when compared to non-participants ($p=0.63$).

Conclusion: Few families received ESS services in the first three months after enrolling in HV. Many families enrolled in HV also participated in TANF, but the rate of ESS service receipt did not differ between TANF participants and non-participants. Few families remained enrolled in HV for a full year, and TANF participants enrolled in HV for shorter durations than TANF non-participants. When families received services related to ESS, they remained enrolled in HV for longer durations. The effect associated with ESS services was not greater for TANF participants. Both TANF participants and non-participants may benefit from the receipt of ESS services early in enrollment.

Committee of Thesis Readers

Committee Members:

Anne Duggan, ScD, Thesis Co-Advisor
Professor, Department of Population, Family and Reproductive Health
Johns Hopkins Bloomberg School of Public Health

Cynthia S. Minkovitz, MD MPP, Thesis Co-Advisor
William H. Gates, Sr. Professor and Chair, Department of Population, Family and Reproductive Health
Johns Hopkins Bloomberg School of Public Health

Andrea Gielen, ScD
Professor, Department of Health, Behavior and Society
Johns Hopkins Bloomberg School of Public Health

Shannon Frattaroli, PhD
Associate Professor, Department of Health, Behavior and Society
Johns Hopkins Bloomberg School of Public Health

Anne W. Riley, PhD
Professor, Department of Population, Family and Reproductive Health
Johns Hopkins Bloomberg School of Public Health

Alternate Committee Members:

Jacky Jennings, PhD
Associate Professor, Pediatrics
Johns Hopkins University School of Medicine

Margaret Ensminger, PhD
Professor and Vice-Chair, Department of Health, Behavior and Society
Johns Hopkins Bloomberg School of Public Health

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Introduction

Many children in the United States are born into circumstances that compromise their health, education, and welfare. Home visiting (HV) programs aim to improve family circumstances through direct services and referrals to other community resources for expectant families and families with young children. In 2016, 160,000 parents and children were served by HV programs in the U.S.[1] Despite high levels of political and financial support for HV, programs experience difficulty retaining families in services. Home visitors are encouraged to align services with family characteristics, but this approach can be challenging if a family's needs extend beyond a program's intended reach or if the program prioritizes outcomes that are different from those of families.

HV can improve a wide array of health and social outcomes for young children and their families.[2–5] HV usually targets families with parenting, economic, biologic, psychological, or behavioral health risks. Families who enter HV programs, however, vary in their parenting risks, assets, goals, and expectations of programs. Home visitors are encouraged by programs to consider these family characteristics in combination with program priorities and policies when planning and carrying out visit activities. Home visitors' abilities and motivations to engage families to address risks may vary by the types of activities and referrals that a family is determined to need.

Longer durations of enrollment in HV have been associated with greater improvements in outcomes, but programs often find it hard to retain at-risk families.[6–12] Families' reasons for enrolling may not be well-aligned with programs' capacities and priorities. Many mothers who leave HV before completing the program report that services were not of interest to them or did not meet their expectations.[13–17]

Service tailoring is the intentional variation in services that maintains fidelity to a program model while adapting services to family interests and needs through shared decision making about visit content and activities.[13,18–21] Service tailoring may be critical to the success of a program because aligning services with a family's interests and needs may increase parental satisfaction with the program. Increased satisfaction with services may then promote continued enrollment and greater improvements in outcomes.[17,22–26]

HV serves a diverse array of families, but research into service tailoring is scant. Differences in family characteristics may be associated with the types of content and referrals delivered to families in visits as well as duration of enrollment in HV. HV research typically focuses on aggregate family outcomes and services delivered and does not investigate tailoring of services to specific family characteristics.[27–30] Examining the extent to which services are tailored for families and whether such tailoring influences continued family enrollment in HV programs may inform program retention strategies. The goal of this study is to understand the association of a family's receipt of services tailored to economic risks with the decision to remain enrolled in HV.

Dissertation Overview

This study has three aims:

Aim 1: To determine the association of economic risks of families newly enrolling in home visiting with their duration of enrollment in services.

Aim 2: To determine the extent to which home visitors tailor services in the first three months of family enrollment to address economic self-sufficiency.

Aim 3: To determine whether early tailoring of services to address economic self-sufficiency is associated with duration of family enrollment.

Theory and Conceptual Framework

This study proposes a framework for assessing family characteristics, service tailoring, and duration of enrollment. No one framework describes the mechanism of service tailoring and its relationship to continued enrollment in HV. The proposed framework is informed by the following three existing models of client engagement in health and social services.

The Andersen Model of Health Services Utilization (see Figure A.1. in Appendix A) describes the multi-level factors that influence an individual's use of health services. These include the external environment and health care system, predisposing and enabling factors, individual need, and personal practices.[31] The current study investigates the influence of individual need on the social service system and the subsequent association with individuals' use of HV services. Individual need is assessed by the home visiting program with risk assessments completed by the program at enrollment in HV. The response of the HV system to individual need is investigated

by the types of content and referrals delivered to families by the home visiting program, as well as the time to delivery. Individual use of services is assessed using measures of family retention in HV services.

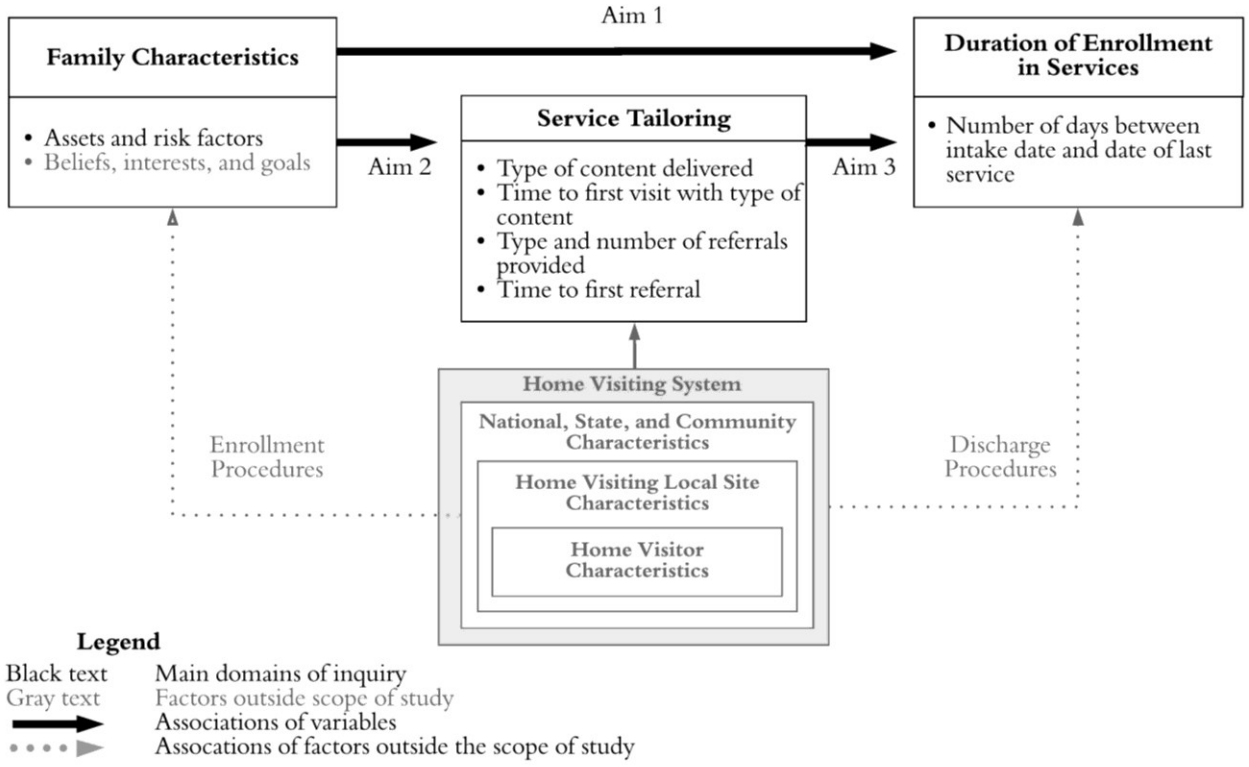
The Integrated Behavior Model (see Figure A.2. in Appendix A) highlights subjective norms and individual attitudes, motivation, knowledge, and agency that predict an individual's decision to undertake a behavior.[32] The current study investigates the decisions of home visitors to tailor (or not tailor) services to the family characteristic of economic risk as evidenced by TANF participation. In home visiting, environmental constraints may be experienced as inadequate materials, time, or funding required to individualize services to family risks. Home visitors may lack referral sources or information about improving family ESS. They may not have the time or organizational support to dedicate to identifying family ESS risks or the ideal services for these families. Home visitors also may not have been trained such that they have the knowledge and skills to tailor services. Workplace norms also may influence the decisions of home visitors to tailor services to ESS. If home visitors observe co-workers tailoring services to ESS, or experience encouragement from their supervisors to do so, they may also be more likely to tailor services to ESS for their clients.

The Integrated Theory of Parent Involvement (see Figure A.3. in Appendix A) was developed specifically for HV to describe the multi-level influences of neighborhood, program, direct provider, and individuals in influencing participation in services.[13,33,34] The current study uses individual-level factors to investigate the duration between program enrollment and the first

receipt of a service, as well as objective program experiences conceptualized as the types of content and referrals delivered in services.

Figure 1 depicts the model used by this study to visualize one pathway by which family characteristics may be associated with service tailoring, as well as how these may influence family duration of enrollment in HV. All factors hypothesized to influence family participation in services cannot be tested in this study. The administrative data used in this study are limited in their description of the constructs in frameworks described above. The main domains of inquiry in this study are displayed below in black. Associations of variables are denoted by solid arrows. Factors and associations outside the scope of this study are denoted in gray font and dotted lines.

Figure 1.1: Conceptual Framework



Aim 1 investigates the association of family characteristics with duration of enrollment in HV. Multiple levels of the HV system influence enrollment and discharge procedures, and thus who stays enrolled in HV programs. Family characteristics, including assets and risk factors, directly influence their duration of enrollment in HV. All families have assets and risks that facilitate or hinder their participation in services. Families also have unique beliefs, interests, and goals that impact their participation in HV. This study incorporated a broad range of risks and assets as covariates. However, family beliefs and the effect of enrollment and discharge procedures are not available in administrative data and were not included in the study.

Aim 2 investigates the extent to which services are tailored to match family characteristics. Service tailoring occurs when services, defined as visit content and referrals to community resources, align with family assets and risks. Multiple levels of the HV system determine whether and how much service tailoring occurs. National, state, and community characteristics influence the characteristics of local sites. Features of local sites influence the characteristics and behavior of home visitors who work there. Home visitors work directly with families to provide services that contain types of content and referrals that may align with family assets and risks.

Aim 3 investigates the association of receipt of services tailored to economic self-sufficiency with duration of enrollment. Families may need or want specific services due to their assets and risks. Families also may share their beliefs, interests, and goals with a home visitor. When services are tailored to address family characteristics such as economic risk, families may feel

more satisfied or engaged in services. There is empirical evidence that a) satisfaction with services increases as content becomes more tailored to individual family characteristics, and b) the association of family characteristics with services provided influences the duration of family enrollment.[35–37]

Study Aims and Hypotheses

This study's three aims and three hypotheses are listed below.

Aim 1: To determine the association of economic risks of families newly enrolling in home visiting with their duration of enrollment in services.

Hypothesis 1: Maternal receipt of Temporary Assistance for Needy Families (TANF) at enrollment in home visiting is associated with a shorter duration of enrollment in services.

Aim 2: To determine the extent to which home visitors tailor services in the first three months of family enrollment to address economic self-sufficiency.

Hypothesis 2: A larger percentage of TANF participants receive education, employment, and financial services, and receive these services sooner after enrollment, than TANF non-participants.

Aim 3: To determine whether early tailoring of services to address economic self-sufficiency is associated with duration of family enrollment.

Hypothesis 3: Receipt of services to address economic self-sufficiency in the first three months of enrollment is associated with longer duration of enrollment for families who participate in TANF.

Chapter 2: Background and Significance

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This review examines peer-reviewed research, evaluative research, and grey literature. First, home visiting (HV) is described and contextualized in the United States generally and New Jersey more specifically. Second, research about family assets and risks at enrollment in HV is described. Third, research about family retention in services is described. Fourth, service tailoring is discussed as an emergent strategy in HV. Finally, gaps in knowledge and research significance are discussed.

Home Visiting in Context

HV is a service strategy that provides health and social services and referrals to families in their own homes. In these visits, home visitors are paired with families to engage in shared goal-setting, curriculum-based activities, routine screenings, and family support. There are many different models of HV that vary in priorities. Most HV models focus on activities to improve maternal and child health and development, prevent child abuse and neglect, encourage positive parenting, and promote school readiness for young children.[8,38–41] Services typically include health screenings, parent support and coaching, developing a plan to achieve family- and program-identified goals, and referring or linking families to community health and social resources.

HV is a key element of the early childhood system of care in the United States. Home visitors are often the most accessible service providers for families who may not regularly access other

health or social service professionals. HV aims to reduce logistical and personal barriers by bringing services into the home and linking families with community resources.[20] The home-based nature of visits supports the development of partnerships between families and home visitors and provides home visitors with insights about the environmental and social family context.[20]

Substantial research demonstrates HV's potential to enhance child health and development as well as family functioning.[2–4,29,35,40,42–45] Research into HV shows significant improvements for particular groups of young children in child abuse prevention, language and cognition, and prevention of myriad health and behavioral problems.[12] Improvements in outcomes are more likely and of greater magnitude when existing family assets are leveraged to address identified needs and promote positive parenting.[46]

There has been strong political and financial support for HV in the U.S. Most HV programs are supported by a mix of federal, state, and local education and health funds.[5] In 2010, Congress established the federal Maternal, Infant, and Early Childhood HV (MIECHV) program, which invested $1.5 billion in HV services.[47,48] Between 2010 and 2014, over 2.3 million home visits were completed across all 50 U.S. states, five U.S. territories, and Washington, D.C.[39] Since 2012, the number of parents and children served by HV programs has quadrupled and the number of home visits delivered has increased five-fold.[5,49] The Medicare Access and CHIP Reauthorization Act of 2015 extended HV funding until September 30, 2017, at which time Congress allowed MIECHV legislation to expire, along with the Children's Health Insurance Program (CHIP).[50] The House of Representatives voted (214 in favor and 209 opposed) to extend MIECHV funding for HV until the year 2022, but the bill did not pass the Senate.[51,52]

Although CHIP funding was extended through fiscal year 2023 on January 22, 2018 as part of a continuing resolution to fund the federal government, MIECHV funding has not been restored and its future remains uncertain.[53,54]

The Department of Health and Human Services (DHHS) requires that HV programs devote at least half of their MIECHV funds to supporting evidence-based models. A model is determined to be evidence-based if rigorous studies consistently show positive outcomes for families. HV Evidence of Effectiveness (HomVEE) is an ongoing systematic review that determines which models have adequate rigorous evidence of effectiveness to be designated formally as evidence-based. As of 2017, HomVEE reviewed studies of forty-five HV models and designated twenty of these as evidence-based.[1,55]

Of the evidence-based models designated by HomVEE, Healthy Families America (HFA) is among the most widely implemented. It is used in 41 U.S. states, four territories, and Washington, D.C.[56] States operating evidence-based models may apply for federal formula and competitive HV grants through the Maternal and Child Health Bureau in the Health Resources and Services Administration of the DHHS. These funds, if received, are typically combined with state and private monies to create a braided funded stream.

Home Visiting in New Jersey

New Jersey has a statewide system of voluntary HV programs. HV in New Jersey began in 1994 in response to a needs assessment of maternal and child health outcomes and child maltreatment

data.[57] HFA was the first program to operate in New Jersey, serving 1,500 families in 19 target communities.[57–59] By 2005, HV in New Jersey nearly doubled enrollment and expanded to include three models (HFA, called Healthy Families New Jersey [HFNJ] within the state, Parents as Teachers, and Nurse-Family Partnership).[60] In 2010, increased investment in HV allowed New Jersey to expand each of these models to all 21 counties. [58,61–64] In 2016, over 5,000 new families enrolled in HV, and 75,000 home visits were provided to nearly 7,000 families across the state.[60] HFNJ is the largest model operating in the state, serving nearly half of families enrolled in HV in New Jersey.

New Jersey operates a statewide central intake system which serves as a single point of entry for information and referral of families to a wide array of family support services including HV. Each county designates a lead coordinating agency that partners with local outreach and community health workers.[58] Prenatal and primary care providers, community-based agencies, and families themselves are the primary sources of referrals to central intake.[58]

HV is funded in New Jersey as a collaboration between three state departments: the Departments of Health, Children and Families, and Human Services.[65] The Department of Health administers the federal MIECHV grant. The Department of Children and Families funds HV with federal Social Security Act Title IVB as well as with State monies. The Department of Human Services has provided Temporary Assistance for Needy Families (TANF) funds to HV since 1995.[66] In 2005, the New Jersey Department of Human Services strengthened its partnership with HFNJ to create the Healthy Families-TANF Initiative for Parents with the goal of strengthening and supporting families who participate in both HV and TANF.[57,64,67] The New Jersey TANF

program provides temporary assistance through cash transfers to families, and also provides support services to encourage economic self-sufficiency (ESS) among economically at-risk families.[62,66,68] In New Jersey, the Healthy Families-TANF Initiative for Parents also provides funding to HV to provide services that encourage ESS.[62,66,68] Families who are enrolled in both HV and TANF can use their HV participation to meet some or all of the TANF mandated employment-directed activity requirements until a child reaches one year of age.[67,69]

Family Assets and Risks at Enrollment

Most HV programs target families at risk for negative health and social outcomes to provide services that focus on building family assets. Family characteristics are comprised of assets and risks that affect individuals within families at the individual, family, community, and societal levels. Assets are protective factors or supports associated with a decreased severity or lower likelihood of negative outcomes.[70] Family participation in HV is intended to create and strengthen assets that improve family and individual well-being. Conversely, risk factors are characteristics associated with an increased likelihood of negative outcomes.[70] Family participation in HV is intended to reduce risks and their adverse effects on family and individual well-being.

Families are screened at multiple times for assets and risks. In New Jersey, many family characteristics, including TANF participation, are assessed early and at multiple points in the HV enrollment process. Providers referring families to HV, such as health professionals, social service providers, and community health workers, have completed one of two standard screening

tools with families to enumerate socioeconomic, pregnancy, medical, psychosocial, and behavioral risk factors.[71] Completed screens are sent to central intake to determine eligibility and need for services. Families at elevated risk for negative health and social outcomes are referred, as indicated, to HV, early intervention, special education, medical care, economic support, substance abuse treatment, and other social service programs in their communities. Families eligible for HV services are contacted by the local site for additional screening and intake.[72,73] At enrollment, home visitors complete comprehensive intake assessments with all families. Home visitors continue to assess and screen for family assets and risks during routine home visits and at specified developmental and post-enrollment time points.

Across the nation, families enrolling in HV exhibit diverse characteristics. Common risk factors include: lack of education or experience in parenting, low educational attainment, poverty, unemployment, lack of access to resources such as health care, childcare, or housing, young maternal age, infant premature birth, poor mental health, poor social support, low English proficiency, substance abuse, and intimate partner or family violence.[7,28,37,40–42,74–83] Education, employment, and financial risks are prevalent. Of families who were eligible for HV in 2015, 13% had not completed high school, more than one-quarter of families lived below the federal poverty threshold, and approximately 30% had no parent who was employed full-time.[84] The Mother and Infant HV Program Evaluation (MIHOPE), a large-scale randomized controlled trial that includes 4,450 families across twelve states, noted widespread economic risk factors among mothers at enrollment in HV. The prevalence of economic risks among families in MIHOPE is comparable to results of national HFA program reports,[85,86] evaluations of Healthy Families

Alaska,[18] and evaluations of Healthy Families New York.[87] Common maternal risk factors include:

- Education: only 25% held degrees higher than a high school diploma,
- Employment: 22% had not been employed in the past three years and 22% participated in TANF, and
- Financial: 64% reported zero earnings in the prior month and 92% received one or more types of public assistance.[88]

Duration of Enrollment in Services

Programs face difficulties in retaining families in services for the length of time recommended by the model. Across all evidence-based HV programs that recommend more than one year of visits, only 58-73% of families remain enrolled at least one year.[89] Ammerman et al. found that 32% of first-time mothers enrolling in HFA dropped out of the program before completion of their first month.[90] A large, longitudinal study of Healthy Families New York found that half of families had dropped out of the program within one year of enrollment.[40,78] Other studies have also found rates of attrition of roughly 50% in the first year of the child's life.[8,16]

Families' reasons for enrolling in HV may differ from the risk-based assessments conducted by programs at enrollment. Families report enrolling in HV to access employment and educational resources, to improve maternal health during pregnancy, and to learn about infant growth and development.[11,13,91,92] Families report leaving HV because they are not interested in program content, do not perceive the program to be beneficial, are uncomfortable with a home visitor, do

not want to have social service workers in their homes, are too busy to engage, or experience household or family upheavals that hinder participation.[13,17,93–97]

Evidence is mixed with regard to the association of family risks with duration of enrollment in HV. Some studies show that families at higher levels of risk are more likely to remain enrolled in programs for the recommended length of services.[98–102] Ammerman et al. found that risks such as poor mental health, substance abuse history, low social support, and increased stress were positively associated with duration of enrollment in HV.[90] Duggan et al. reported similarly that families with substance abuse risk factors were more likely to remain enrolled in services.[103] Other studies have found that families with higher levels of risk remained enrolled for shorter durations of enrollment.[101,104–106] HV impacts may be diminished when families do not receive services at the rate, schedule, and dosage recommended by models.[3,11,42,81,83]

TANF participation has not been empirically linked to duration of enrollment in HV, though families who struggle to find employment may have a shorter duration of enrollment in HV programs.[16] The partnership between HFNJ and TANF may encourage TANF recipients to remain enrolled in HV in order to partially meet TANF work, education, and job-training requirements.[69,95,107,108] Programs in New Jersey report that retaining TANF families in services is a significant difficulty once their TANF case closes or they enroll in another activity that fulfills their 35-hour-weekly TANF work requirement.[61]

Some characteristics, such as being a native non-English speaker, have been found to be predictive of longer enrollments in HV.[25,109–111] The strong association of speaking Spanish with

an increased duration of enrollment is well-documented. Studies have found that Latina mothers are more likely to enroll in HV[11,28,112,113] and remain enrolled for longer periods than African-American or European-American mothers.[21,26,114,115] Monolingual Spanish-speaking families may continue their enrollment in HV because home visitors can provide translation assistance, support, and linkages to other social services.[30,109,115] Home visitors may resemble trusted and highly respected community health workers, or *promotoras*, which are prevalent in many Spanish-speaking immigrants' countries of origin.[32,116] Also, home visitors may be perceived as surrogate extended family members for clients whose biological families may be separated by national borders.[30,109,115]

Service Tailoring

HV programs use different service models intended to deliver a range of one-on-one services to families with heterogeneous assets, risks, and interests at enrollment to HV. Services are expected to exhibit some variation. Service tailoring is the purposeful variation in a program's intended model and service content as it is adapted to family characteristics, risks, and assets through ongoing shared decision making and agenda setting.[16,19,23,117,118] Successful tailoring may result in families experiencing greater satisfaction with services, leading to a longer duration of enrollment.[32,46,77,119–121]

Service tailoring requires sophisticated adaptations of program content to align with family assets and risks. Home visitors, supervisors, and staff must maintain fidelity to their intended model(s) while negotiating the delivery of core content to families, the co-selection of additional

content by family and home visitor, and the actual delivery of services. Programs must juggle national, state, model, site, home visitor, and family desires and priorities. These priorities of programs change over time as national, state, model, and local leadership and funding change.[86,122–124] Home visitors, too, are encouraged to varying degrees by their local leadership and national models to tailor services to family assets and risks.[22,27,119,125]

Implementing a coherent and responsive set of services poses challenges. Program evaluations that report service content show variability in sites' ability to address the needs exhibited by families at enrollment.[24,74,112,126] However, a review of 20 randomized trials of HV programs reported that only 40% provided any description of services provided to families.[83] When services were described, home visitors were often found to miss opportunities to refer families to community resources.[83] Tandon et al. found that only 27% of women in need of mental health, substance abuse, or domestic violence services received these services.[36] Non-sensitive parenting difficulties such as nutrition or housing were more likely to be addressed than sensitive issues such as parental mental health, substance abuse, or intimate partner violence.[83]

Conclusion

The proposed study investigates service tailoring to ESS and its association with duration of enrollment. Whether and how services might be tailored to improve outcomes for families requires a greater understanding of the association of family characteristics, delivery of ESS services, and continued family enrollment in HV. This study may inform interventions in HFNJ and in HV nationwide to improve HV outreach, services, and retention efforts.

Chapter 3: Research Design and Methods

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Study Design

A retrospective cohort study assessed duration of enrollment up to one year for expectant women and mothers with a child under three years old who enrolled in Healthy Families New Jersey in 2014-2015. The study was conducted to investigate the association of the characteristics of families enrolling in home visiting (HV), the services they receive in their first year of enrollment, and subsequent duration of enrollment in HV.

Aim 1 investigates the association of maternal characteristics with duration of enrollment for newly enrolled families in HV. The study described in Chapter 4 specifically investigates the relationship between participation in the Temporary Assistance for Needy Families (TANF) program and duration of enrollment in HV. The study tests the hypothesis that TANF participation at enrollment is negatively associated with duration of enrollment in HV.

Aim 2 examines visit content and referrals delivered to families early in their enrollment in HV and the ways these services align with family characteristics. The study described in Chapter 5 specifically investigates the extent to which home visitors delivered economic self-sufficiency (ESS) services to families at heightened economic risk as evidenced by their participation in TANF. The study tests hypotheses that a higher proportion of families who participate in TANF receive ESS services, and do so sooner after enrollment in HV, than families who do not participate in TANF.

Aim 3 investigates how services aligned with family characteristics early in enrollment influence retention in HV. The study described in Chapter 6 specifically investigates the association of enrollment in both HV and TANF, ESS services delivered during home visits, and duration of enrollment in HV. The study tests the hypothesis that TANF participants who receive ESS services will remain in services for a longer duration than families who participate in TANF but do not receive ESS services.

Data Source

The study uses Healthy Families New Jersey (HFNJ) administrative data for 2014 to 2016. The data sources include information on visit content, referrals, standardized screening dates and scores, and family social, economic, and demographic characteristics collected during the first year of family enrollment in HV. Missing data were negligible; data were complete for 87.2% of the total sample. Mean and mode imputation were performed to estimate values for missing data.

Human Subjects Approval

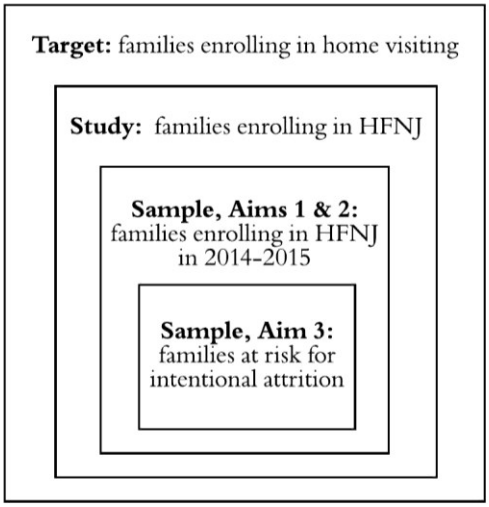
The study is a secondary data analysis of existing, de-identified data from the Healthy Families New Jersey Management Information System (MIS). This study was determined to be not human subjects research as defined by the Department of Health and Human Services regulations 45 CFR 46.102 by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) Office on July 26, 2017.[127] (See Appendix L for IRB determination.)

Study Sample

Inclusion Criteria

Figure 3.1 displays the target and study population from which the study samples are drawn. The target population is families enrolling in HV. The study population is families enrolling in HFNJ HV programs.

Figure 3.1: Study Populations and Samples



The study sample for Aims 1 and 2 includes families enrolling in these programs in 2014 and 2015 who received at least one visit in order to describe and investigate correlates of early attrition as well as longer durations of enrollment in the program for Aims 1 and 2. Families were eligible for inclusion in the study if they enrolled in HFNJ between January 2014 and December 2015 and received at least one home visit. Families included an expectant woman or mother living in New Jersey with one or more children under three years of age. Families were referred to HV by a prenatal or primary care provider, community-based agency, or other professional. Families were screened by a centralized intake system and/or the local HV

program to determine family needs and facilitate participation in HV.[70] Within three days of referral to a local HFNJ site, a family should be contacted for an assessment visit from a Family Assessment Worker, who conducts an open-ended interview and completes the Family Survey screening form (see Measures for a description of the Family Survey). Families were offered HV services if they scored between 25 and 45 on the Family Survey.[64] Families could also be enrolled on a case-by-case basis if they scored too low or too high on the Family Survey but were determined to be at risk for adverse social, economic, or health outcomes.

The study sample for Aim 3 is a subset of the sample for Aims 1 and 2: families who were able to choose to discontinue enrollment in HV. Families were excluded from the study if they unintentionally discontinued their enrollment in HV. Reasons for non-intentional attrition included a change of residence out of the program service area, transfer to another HV program outside the state, or death of parent, child, or fetus during the study period. Some programs were unable to serve certain families after they enrolled because of lack of program staff or budget, or because families expressed needs greater than the program could address. Families with unintentional attrition were excluded from the sample for Aim 3 because this aim assessed whether receipt of ESS services early in the program was associated with a family's decision to remain enrolled in HV. Addressing this aim required that families have the option for continued participation in HV.

The two-year study period was selected for two reasons. First, policies and procedures in recruitment, enrollment, service delivery, and discharge change over time. Limiting the study to two years ensures that families were subject to similar policies and procedures. Second, the

proportion of families who would receive ESS services was unknown. For this reason, a two-year period was selected to generate a sample that provided adequate power for hypothesis testing.

Initially, the study required that families receive at least two visits within the first three months of enrollment to ensure a minimum number of visits occurred in which services could be tailored. A family's second visit was chosen as the first visit in which services could be meaningfully tailored because previous evaluations of New Jersey home visiting programs found that an average of 48% of time in the first visit was devoted to administrative tasks (range 0-100%).[111] However, upon analyzing the data, it was discovered that nearly a quarter of families received education or ESS content in the first visit, and nearly 4% received a referral before they even formally enrolled in the program. Furthermore, about 7% of families enrolling in 2014-15 received only one visit. For these reasons, the inclusion criterion for at least two visits was dropped.

Power Analyses

Power analyses were conducted to confirm that each analytic sample selected by the study was of adequate size to power the hypothesis tests. Log rank tests with hazard ratios set at 0.5 and significance levels of 0.05 were used to estimate sample sizes in the presence of censoring.[128] The log rank test was chosen because it compares the hazard ratios of two or more groups that may be unequal in size.[129] Effect sizes of two weeks and one month duration of enrollment were investigated using a hazard ratio of 0.5 and power of 80%. To detect the listed enrollment differences in the adjusted survival curves at a power of 0.80 using the sample size of the study

(n=2,779), the study required at least as many events (either attrition or delivery of ESS services) as shown in Table 3.1. The study was adequately powered for these analyses.

Table 3.1: Power calculation

				TANF, *N* Required	
Alpha (α)	**Effect size**	**Z-score**	**Power (1-β)**	**Participants**	**Non-participants**
0.01	2 weeks (0.04 year)	2.58	0.8	50	64
0.05		1.96		34	43
0.01	1 month (0.09 year)	2.58	0.8	55	69
0.05		1.96		37	47

Note: Calculations for study sample where TANF participants n = 856 and TANF non-participants n = 1,923.

Variables

Key variables and operational definitions are highlighted below. Appendix B lists the analytic variables used in the study. Appendix C identifies the components of the MIS from which the variables were extracted.

Dependent Variables

The dependent variable for Aims 1 and 3 was duration of enrollment in HV. No single measure captures all dimensions of family participation in services. In 2015, the MIHOPE Implementation Research Team articulated four aspects of service delivery: overall dosage, visit content, service quality, and participant responsiveness.[130] They identified twelve possible indicators to measure HV service participation and retention.[130] This study used the MIHOPE Implementation Research Team's recommendation to measure dosage by calculating the length of time between program enrollment and the date of last visit and by creating measures of family enrollment status at specified post-enrollment dates.[130]

In this study, duration of enrollment was measured as the number of days between the enrollment date and the final completed home visit. The intake date was the formal date of enrollment. The final home visit dates occurred when families received no further home visits, although attempts to engage families may have continued after this point. See Appendix G for sensitivity analyses and a discussion of discrepancies between formal enrollment dates and the date of final home visit. Attempts to re-engage families were not included as visits.

Duration variables were subject to fixed censoring at a maximum survival time of 365 days after enrollment. Families whose durations of enrollment were longer than one year were censored at 365 days. Fixed censoring was preferable to Type II censoring (following families for their entire duration of enrollment) for this study due to the long potential enrollment in HV. Families who entered prenatally and exited at their children's three-year birthdays could have remained enrolled in HV for more than 3.5 years. To avoid censoring, the study would have had to use enrollment data from 2010-2012. Fixed censoring allowed this study to use recently collected data to report current enrollment durations.

The dependent variable for Aim 2 was receipt of ESS services. Receipt of ESS services was considered service tailoring if a family was also determined to be at elevated economic risk. A family was determined to have received ESS services early in their enrollment in HV if they received ESS content in at least one visit or at least one referral within three months of enrollment. Service delivery was indicated by home visitor completion of visit forms and referrals forms in the HFNJ management information system. Services included *content* (topic

discussed during the home visit) and *referrals* (linkages to services other than home visiting). See Table C.2 in Appendix C for a list of all content and referrals recorded in the administrative data.

ESS content: Visitors document the content in each visit in the Visit Log Form. Ninety-six content areas are represented on this form using check boxes; fifteen of these content areas are for ESS content. More than one box may be checked per visit. Families were determined to have received ESS content if, in the course of at least one home visit, the home visitor included content related to education, employment, or financial content. Education content included: 1) Provided information on educational and training options. Employment content included: 2) Discussed employment and training and 3) Provided employment information and/or helped parent(s) look for job. Financial content included: 4) Discussed household income and/or financial literacy and 5) Provided information and/or assistance on ESS.

ESS referrals: Visitors document the referrals provided to families by entering a number corresponding to the type of referral in the Service Referral Form. Sixty-seven referral services are recorded in total; eleven of these referrals are to ESS services. More than one referral may be recorded per visit. Families were determined to have received an ESS referral if, in the course of at least one home visit, the home visitor provided a referral to an education, employment, or financial resource other than the HV program. Education referrals included referrals to adult basic education, GED preparation, special education, college, or other educational services. Employment referrals included referrals to job readiness and/or employability skills, job search and placement assistance, work experience, One-Stop Career

Center, or Vocational or job skills training. Financial referrals included referrals to a money management service.

Using reports of content and referrals delivered to families, three family-level indicators of ESS services were created.

ESS services in the first three months: A binary variable was created to indicate whether the family had any visit with ESS content or any referral to promote ESS in the first three months of enrollment.

ESS services in the first year: A binary variable was created to indicate whether the family had any visit with ESS content or referrals in the first year of enrollment.

Time to delivery of ESS services: A continuous variable was created to count the number of days from enrollment to the first instance of receipt of content or referrals tailored to ESS. For families who did not receive ESS services, the number of days was set to the maximum number in the study, 365 days. For families who received referrals before their enrollment date, their time to delivery of first referral was set to zero days, or the first day of enrollment.

Independent Variables

The key independent variable for Aims 1 and 2 is TANF participation. A dichotomous variable was created to indicate whether a family was identified as a TANF participant at intake or within one month of enrollment to HFNJ. The MIS contains a binary variable indicating a family's TANF status at enrollment in HV. In the context of this study, TANF participation is a family characteristic that indicates the need for ESS content and referrals.

The key independent variable for Aim 3 was service tailoring to ESS. Service tailoring to ESS was also the dependent variable for Aim 2; see description in Dependent Variables above.

Selection and Preparation of Covariates

Covariates were considered on a theoretical basis if they had been used in randomized controlled trials of Healthy Families America determined to be of 'high quality,' had been found to be significantly predictive of duration of enrollment, and were available in the MIS during the specified period of the study. For a list of all covariates examined for inclusion, their association with the independent variable, and their availability in study data, see Table E.1 in Appendix E. Thirty-one potential covariates were identified by examining reports from five major randomized controlled trials of Healthy Families America that were rated high-quality by the HV Evidence of Effectiveness systematic review.[131,132]

Covariates identified above were included if their distributions varied significantly across subgroups of interest (see Table E.2 in Appendix E) and did not exhibit significant missingness. Where data were missing or invalid, cleaning, correction, and imputation were performed (see

Appendix H). Potential covariates were included if they were not correlated with other covariates of interest using Spearman's rank-order correlation (see Table E.3 in Appendix E). Of the potential covariates examined, only parity and gravida were significantly correlated (R^2=0.97, p<0.001) using the significance level of $R^2 \geq 0.40$ and $p \leq 0.05$. Parity and gravida were examined individually for missingness and the variable with the least amount of missingness (parity) was chosen for inclusion.

Maternal demographic characteristics that met these criteria were: age at enrollment in HV, highest educational attainment, marital status, parity, primary language, poor maternal mental health, employment status, prenatal entry into HV, and maternal score on the Family Survey.

A continuous variable for maternal age was calculated by subtracting the maternal birthdate from the enrollment date and rounding to the last completed birthday. Maternal age was then categorized as <18, 18-24, 25-34, ≥35 years.

Maternal educational attainment at enrollment was recorded in administrative data. A categorical variable indicated whether mothers had attained less than high school, had completed high school or GED, had attended some college, or had completed a degree beyond high school. A degree beyond high school was defined as additional training through vocational programs, Associate's degrees, Bachelor's degrees, or graduate education.

Marital status was recorded in administrative data. A binary variable was created to indicate whether a mother was married or unmarried. Mothers who were married or remarried were

considered married. Women who were single, living together but unmarried, separated, divorced, or widowed were considered unmarried.

Parity was recorded in the administrative data as a continuous variable recording the number of previous births. An ordinal variable was created for this study to indicate whether a woman had zero children, one child, or more than one child at enrollment.

Administrative data included whether families primarily spoke English, Spanish, or Other at enrollment. A dichotomous variable was created to indicate whether families were primarily English speaking or non-English speaking.

A dichotomous variable for poor maternal mental health was created to indicate whether a mother was identified using the assessment and intake measures included in the MIS as having a) a history of depression or other mental illness, b) current depression, or c) current service involvement for mental health. The variable was constructed by searching administrative data sources in which mental health history may be recorded at pre-enrollment, at eligibility assessment, and at intake.

Administrative data included a dichotomous variable indicating whether mothers reported being currently employed for pay.

Prenatal entry to HV was calculated by subtracting the child's date of birth or the expected date of delivery for pregnant women from the intake date. A dichotomous variable was created that indicated whether a family entered prenatally or postnatally.

The Family Survey is a screening tool used before enrollment to HFNJ to enumerate family risk factors on a scale of zero to 85.[133] The Family Survey score increases in five unit increments as families are determined to be at low, medium, or high risk for factors associated with increased risks of adverse health and social outcomes for children.[64,133] The risk factors assessed on the Family Survey include teen or first-time pregnancy, household poverty, inadequate prenatal care, unstable housing, social isolation, poor mental health, substance use, intimate partner violence, and previous reports of child abuse or neglect. The Family Survey score was included as a continuous variable. Families who exhibit no risks receive a zero on the Family Survey. Families who score between 25 and 45 on the Family Survey are offered services to HFNJ. Families who score lower or higher may be offered enrollment at the discretion of the HFNJ site.[64]

Clustering of Data

The model was adjusted for the clustering effect of program site on the basis of conceptual and empirical evidence.[134]

> *Conceptual evidence:* First, local programs varied in some relevant policies. Some counties allowed families that participated in TANF to use HV enrollment to fulfill some TANF requirements, while others did not.[135] This may have influenced the motivation of families to remain enrolled in HV. Second, home visitors were trained and supervised

locally and subjected to different expectations. They may have had differing strengths and priorities that were linked to those of their sites.

Empirical evidence: Independent and dependent variables were influenced by program site. First, the distribution of independent variables varied by program site. Second, the mean and median of the dependent variables varied by program site. Third, program site was regressed on the dependent variables, and program site was found to have varying effects on duration of enrollment. Output from empirical cluster analyses are included in Appendix F.

Treatment of Missing Data

All families received at least one home visit with the dates of these visits recorded. Each home visit had at least one visit content and/or referral box checked. Screening and intake measures for TANF participation were present for all families.

Covariates were evaluated for missingness by creating a variable that counted the overall total of missing covariates by family. Chi-square tests were used to compare overall missingness. There was no significant difference in overall missingness between TANF participating and non-participating families ($p=0.64$).

The total number of families missing at least one covariate was 357. The percentage of families missing at least one covariate was 12.8%. Only 3.0% of families were missing two or more covariates. To preserve a maximum number of study participants and limit bias in participant

subgroups in multivariate models, unconditional mean and mode imputation were conducted to populate missing variable values.[136] See Appendix H for tables describing missingness across covariates and comparisons by TANF participation.

Analytic Methods

Aim 1 investigated the association of family economic risk with duration of enrollment in services. Aim 2 evaluated the association of family characteristics with services tailored to ESS. Aim 3 tested the association of service tailoring to ESS with duration of enrollment in services. Data preparation and aim-specific analyses are described below.

Analytic Methods: Aim 1

Aim 1: To determine the association of economic risks of families newly enrolling in home visiting with their duration of enrollment in services.

Hypothesis 1: Maternal receipt of Temporary Assistance for Needy Families (TANF) at enrollment in home visiting is associated with a shorter duration of enrollment in services.

To achieve Aim 1, the following steps were carried out: 1) describe the characteristics of the sample at enrollment, including reasons for disenrollment; 2) describe the duration of enrollment in the sample; 3) describe the association of TANF participation with duration of enrollment.

First, characteristics of the sample were described using univariate and bivariate measures to give a general picture of family assets and risks at entry to HFNJ for the full sample, for families who participated in TANF, and for families who did not participate in TANF.

Univariate and bivariate descriptive statistics were calculated using proportions, means, standard deviations, Student's *t* tests, and chi-square statistics. Means were calculated and compared using two independent samples t-tests for continuous variables. Proportions were calculated and compared using Pearson's chi-square for binary and categorical variables. Independent variables and covariates were tested for multicollinearity using Spearman's pairwise correlations.

Second, dependent variables were described using univariate and bivariate measures for the full sample, for families who participated in TANF, and for families who did not participate in TANF. Duration of enrollment was described using means, medians, and standard deviations. The possible values for duration of enrollment ranged from zero days to 365 days.

Third, a survival analysis was conducted to test the relationship of TANF participation with duration of enrollment. The survival analysis was conducted by calculating summary statistics of time at risk for attrition, incidence rates of attrition, and proportions enrolled at follow-up periods for the full sample, for families who participated in TANF, and for families who did not participate in TANF. Life tables were constructed using the Kaplan-Meier approach to calculate survival functions and hazard ratios for each group. The survival probability was modeled separately for the full sample, for families who participated in TANF, and for families who did

not participate in TANF using the formula in Figure 3.2. Standard errors were calculated using Greenwood's formula[137] and confidence intervals were constructed from these.

Figure 3.2: Survival equations

Kaplan Meier: $S_{t+1} = S_t\,((N_{t+1}-D_{t+1})/N_{t+1})$

Standard error: $SE(S_t) = S_t\sqrt{\sum \frac{D_t}{N_t\,(N_t - D_t)}}$

Cox proportional hazards: $\lambda(t) = \lambda_0(t)exp(\beta_1 X_{i1} + \ldots + \beta_p X_p)$

where

- S_t = the probability of a family remaining enrolled in HV past time t, given that a family has remained enrolled until time t
- N_t = the number of families who are enrolled and considered at risk during the interval t
- D_t = the number of families who discontinue enrollment during the interval t
- $\lambda(t)$ = hazard rate (HR) at time t
- $\lambda_0(t)$ = baseline hazard (all $Xs = 0$)
- t = time (days)
- β_1 = change in HR for families who participated in TANF
- β_p = change in HR for mothers with selected covariates if also TANF participant
- X_1 = family characteristic (0: TANF non-participant, 1: TANF participant)
- X_p = covariates (0: no, 1: yes)

The model was adjusted for covariates and clustering by site. Cox proportional hazards models were constructed to test for differences in survival times between families by TANF participation. The cumulative survival function was calculated as the probability of remaining enrolled in the program up to and past time t. Hazard rates were constructed to calculate the probability of attrition at a given time assuming that a family has remained enrolled until that

time for the full sample, for families who participated in TANF, and for families who did not participate in TANF. The hazard rates of TANF participants and non-participants were used to calculate hazard ratios (HRs) estimating relative risks of attrition.

Unadjusted Kaplan-Meier and adjusted Cox proportional hazards survival curves were plotted and equivalencies between the survival curves were compared using log-rank tests (see Figure 3.3). The log rank test compared the probabilities of survival depicted in survival curves using an approximated chi-square test statistic. It did so by comparing the observed number of events (family attrition from the program) in the groups under examination (TANF participants vs. TANF non-participants) to what would be expected if there were no difference in survival between the groups.[129]

Figure 3.3: Equation for log-rank test

$$\chi^2 = \Sigma \frac{(\Sigma O_{jt} - \Sigma E_{jt})^2}{\Sigma E_{jt}}$$

where

ΣO_{jt} = sum of the observed number of events (number of families exhibiting attrition) in the group who participated in TANF

ΣE_{jt} = sum of the expected number of events (number of families exhibiting attrition) in the group who participated in TANF

The assumptions of the Cox proportional hazards model were tested using plots, proportional hazards tests, and log-rank tests and found to hold for the adjusted models. The log-rank test confirmed that individuals in the sample had survival times that were independent of one another; no family's service receipt was dependent on that of another family. Proportional

hazards plots confirmed that hazard ratios were constant over time, as well as that the hazard ratios did not cross one another across times. Family intake dates were included as the dependent variable in Cox regression models and confirmed to be independent of one another. The hazard ratio was confirmed to be constant over time when examining the population by quarter of study entry and by covariate.

Analytic Methods: Aim 2

Aim 2: To determine the extent to which home visitors tailor services in the first three months of family enrollment to address economic self-sufficiency.

Hypothesis 2: A larger percentage of TANF participants receive education, employment, and financial services, and receive these services sooner after enrollment, than TANF non-participants.

To achieve Aim 2, the following steps were carried out: 1) describe the services delivered to families during the course of home visits in the first three months and first year after enrollment; and 2) test the association of TANF participation with ESS service receipt.

First, a descriptive approach provided a general picture of education, employment, or financial services that were provided to families after enrollment in HV. (See Table 3.2 for a list of univariate and bivariate tests performed on dependent variables. Bivariate analyses of differences in service receipt were tested using Pearson's chi square for binary and categorical variables. Means were compared using two independent samples t-tests for continuous and ordinal variables.

Table 3.2: Univariate descriptive and bivariate testing for outcomes for Aim 2

Dependent variable	**Described / tested using:**
1) Receipt of ESS services in the first three months after enrollment (binary)	a) any ESS service in at least one visit, b) education services in at least one visit, c) employment services in at least one visit, and d) financial services in at least one visit
2) Receipt of ESS services in the first year after enrollment (binary)	a) any ESS service in at least one visit, b) education services in at least one visit, c) employment services in at least one visit, and d) financial services in at least one visit
3) The number of days from enrollment to receipt of ESS services (count)	a) the first instance of any ESS service receipt, b) the first instance of an education service receipt, c) the first instance of an employment service receipt, d) the first instance of a financial service receipt

Second, models tested the association of TANF participation with education, employment, and financial service receipt. Hypothesis 2 assessed whether service tailoring occurred by testing whether measures of service receipt differed between families who participated in TANF and families who did not participate in TANF.

Survival analyses tested the relationship of TANF participation with time to receipt of ESS services. The survival analysis was conducted by calculating summary statistics of time at risk for service receipt, incidence rates of service receipt, and proportions receiving services at three months and one year after enrollment. Life tables were constructed using the Kaplan-Meier approach to calculate survival functions for each group.

The survival probability was modeled for families who participated in TANF using formulas in Figure 3.2, where:

S_t = the probability of not receiving education, employment, and/or financial service(s) past time t, given that a family has remained enrolled until time t

N_t = the number of families who are enrolled and considered at risk during the interval t

D_t = the number of families who receive education, employment, and/or financial service(s) during the interval t

Standard errors were calculated using Greenwood's formula[137] and confidence intervals were constructed from these. The model was adjusted for covariates and clustering by site. Unadjusted and adjusted Cox proportional hazards models were constructed to test for differences in survival times between families by TANF participation. Hazard rates were constructed to calculate the probability of receiving an ESS service at a given time assuming that a family had not yet received an ESS service until that time.

The hazard rates of TANF participants and non-participants were used to calculate unadjusted hazard ratios estimating relative risks of receiving ESS services using the Cox proportional hazards regression model in Figure 3.2, where:

$\lambda(t)$ = hazard rate (HR) at time t

$\lambda_0(t)$ = baseline hazard (all $Xs = 0$)

t = time (days)

β_1 = change in HR for families who participated in TANF

β_p = change in HR for mothers with selected covariates who participated in TANF

X_1 = family characteristic (0: TANF non-participants, 1: TANF participants)

X_p = covariates (0: no, 1: yes)

The model was stratified by TANF participation, and the hazard ratio was re-calculated 1) comparing primary English speakers and non-English speakers among TANF participants, and 2) comparing primary English speakers and non-English speakers among TANF non-participants. The model was stratified by language because analyses in Aim 1 found differences in these groups. Adjusted Cox proportional hazards survival curves were plotted and equivalencies between the survival curves were compared using log-rank tests. The log-rank test compared the observed number of events (first receipt of ESS services) in the groups under examination (TANF participants vs. non-participants) to what would be expected if there were no difference between the groups.[129] The equation is described in Figure 3.3, where:

ΣO_{jt} = sum of the observed number of events (number of families receiving education, employment, and/or financial services) in the group who participated in TANF

ΣE_{jt} = sum of the expected number of events (number of families exhibiting attrition) in the group who participated in TANF

The assumptions of the Cox proportional hazards model were tested using plots, proportional hazards tests, and log-rank tests and found to hold for the adjusted models. The log-rank test confirmed that individuals in the sample had survival times that were independent of one another; no family's service receipt was dependent on that of another family. Proportional hazards plots confirmed that hazard ratios were constant over time, as well as that the hazard ratios did not cross one another across times. Family intake dates were included as the dependent variable in Cox regression models and confirmed to be independent of one another. The hazard ratio was confirmed to be constant over time when examining the population by quarter of study entry and by covariate.

Analytic Methods: Aim 3

Aim 3: To determine whether early tailoring of services to address economic self-sufficiency is associated with duration of family enrollment.

Hypothesis 3: Receipt of services to address economic self-sufficiency in the first three months of enrollment is associated with longer duration of enrollment for families who participate in TANF.

To achieve Aim 3, the following steps were conducted: 1) restrict the sample based on additional inclusion criteria; 2) construct life tables and calculate survival probabilities using the Kaplan-Meier approach; 3) plot survival curves; 4) adjust models for covariates using Cox proportional hazards regression; 5) compare adjusted and unadjusted survival curves using the log rank test.

Sensitivity analyses investigated reasons for attrition using chi-square statistics for the full sample, for families who participated in TANF, and for families who did not participate in TANF. Families were excluded from the study if they unintentionally discontinued their enrollment in HV as described in inclusion criteria for Aim 3.

A survival analysis was conducted to test the association of TANF participation and receipt of ESS services in the first three months after enrollment with duration of enrollment. The survival analysis was conducted by calculating summary statistics of duration of enrollment, incidence rates of attrition, and proportions enrolled at follow-up periods. Summary statistics of duration of enrollment were calculated after stratifying by a) TANF participation; b) receipt of ESS

services; and c) TANF participation and receipt of ESS services. Student's t-tests were conducted to test for differences in duration of enrollment in a), b), and c).

Life tables were constructed using the Kaplan-Meier approach to calculate survival functions for each group. The survival probability was modeled separately for all participants, as well as separately for subgroups stratified by TANF participation and by receipt of ESS services, using the formula in Figure 3.2. Standard errors were calculated using Greenwood's formula[137] and confidence intervals were constructed from these. Survival curves were plotted from these life tables to create a visual model of risk of attrition at each time point.

Cox proportional hazard models produced unadjusted hazard ratios, which were then adjusted for covariates and clustered by site. The survival function was calculated as the probability of remaining enrolled in the program up to and past time *t*. Hazard rates were constructed to calculate the probability of attrition at a given time assuming that a family has remained enrolled until that time.

The hazard rates of ESS recipients and non-recipients were used to calculate hazard ratios (HRs) estimating relative risks of attrition. Unadjusted hazard ratios were then adjusted for covariates and clustered by site. Hazard ratios were compared the relative risk of attrition for families who received ESS services within three months after enrollment vs. families who did not receive ESS services within three months after enrollment.

Hazard ratios were calculated using the Cox proportional hazards regression model in Figure 3.2 for the full sample, where:

$\lambda(t)$ = hazard rate at time t

$\lambda_0(t)$ = baseline hazard (all $Xs = 0$)

t = time (days)

β_1 = change in hazard rate for mothers who received ESS services

β_p = change in hazard rate for mothers with selected covariates who did not receive ESS services

X_1 = ESS tailoring receipt (0: no, 1: yes)

X_p = covariates (0: no, 1: yes)

Unadjusted Kaplan-Meier and adjusted Cox proportional hazards survival curves were plotted and equivalencies between the survival curves were compared using log-rank tests. Models were stratified by TANF participation and re-calculated.

The assumptions of the Cox proportional hazards model were tested using plots, proportional hazards tests, and log-rank tests and found to hold for the adjusted models. The log-rank test confirmed that individuals in the sample had survival times that were independent of one another; no family's service receipt was dependent on that of another family. Proportional hazards plots confirmed that hazard ratios were constant over time, as well as that the hazard ratios did not cross one another across times. Family intake dates were included as the dependent variable in Cox regression models and confirmed to be independent of one another. The hazard ratio was confirmed to be constant over time when examining the population by quarter of study entry and by covariate.

Chapter 4: Duration of Enrollment in Home Visiting and Participation in Temporary Assistance for Needy Families

Chapter 4: Association of Participation in Temporary Assistance for Needy Families with Duration of Enrollment in Home Visiting

Abstract

Objectives: Many families and young children enrolled in home visiting (HV) experience health and social benefits, but HV programs often have difficulty retaining families in services. The goal of this study was to investigate the association of economic self-sufficiency risks indicated by participation in the Temporary Assistance for Needy Families (TANF) program with duration of enrollment in HV.

Methods: A retrospective cohort study assessed duration of enrollment up to one year for expectant women and mothers with a child under three years old who enrolled in Healthy Families New Jersey in 2014-2015. Survival analyses compared retention in HV in the first year for families who participated versus did not participate in TANF. Models were adjusted for family characteristics and clustered by site. The analyses were repeated after stratifying by primary language spoken.

Results: Among the 2,779 newly enrolling families, 856 (31.0%) families also participated in TANF. The average duration of enrollment was 175 days for families participating in TANF and 216 days for non-participating families ($p<0.001$). However, adjusted hazard ratios (HR) found no association between TANF participation and risk of attrition in HV ($p=0.81$). After stratifying by primary language, participation in TANF was associated with more than three times the risk of attrition in primarily non-English speaking families (HR 3.24, $p=0.05$) but not for primarily English speaking families ($p=0.99$).

Conclusion: Few families remain enrolled in HV for one year. Many families enrolled in HV also participate in TANF. TANF participants enroll in HV for shorter durations than TANF non-participants. TANF participants who are primarily non-English speaking differ from English-speaking TANF participants in their duration of enrollment in HV. To reduce attrition, HV programs may want to improve their outreach and retention efforts for families known to engage in HV for shorter durations of enrollment. To maximize the benefits of HV to families, HV programs may want to focus on enrolling subgroups who are known to remain enrolled in services longer.

Introduction

Many children in the United States are born into circumstances that compromise their health, education, and welfare. Home visiting (HV) programs aim to improve family circumstances through direct services and referrals to other community resources for expectant families and families with young children. In 2016, 160,000 parents and children were served by HV programs in the U.S.[1] In home visits, home visitors are paired with families to engage in shared goal-setting and curriculum-based activities that support family asset-building. Research into HV has shown significant improvements for young children in child abuse prevention, language and cognition, and prevention of many health and behavioral problems,[2–5,12] but retention in services is a challenge across all programs and settings.[7,17,26,30,138] Increasing family duration of enrollment in HV has been associated with greater improvements in outcomes, but programs often experience challenges in retaining at-risk families.[6–12] The goal of this study was to investigate the association of maternal characteristics with duration of enrollment for newly enrolled families in HV.

HV in the United States usually serves families experiencing behavioral, health, parenting, or social adversity.[46] Families who participate in HV often live in challenging circumstances that include limited economic self-sufficiency (ESS), characterized by low educational attainment, poverty, and unemployment. Of families who were eligible for HV in 2015, 13% had not completed high school, more than one-quarter of families lived below the federal poverty threshold, and approximately 30% had no parent who was employed full-time.[84] Families who participated in the Mother and Infant Home Visiting Program Evaluation (MIHOPE), a large-scale randomized controlled trial that includes 4,450 families across twelve states, exhibited the

following ESS risks: three-quarters of families had attained a high school diploma or less; more than one-fifth of families in HV had not been employed in the prior three years; more than 90% of families were supported by some public assistance; and more than one-fifth of families participated in TANF.[88]

Between 27%-50% of families who enroll in evidence-based HV programs do not complete the first year as recommended, with up to one-third discontinuing enrollment within the first month.[8,14,16,28,37,40,75,78,89–91] Families may choose to leave services voluntarily, or programs may decide to disenroll families. Families report leaving HV because they are not interested in program content, do not perceive the program to be beneficial, are uncomfortable with the home visitor, do not feel comfortable opening their home to the home visitor, are too busy to engage, or experience household or family upheaval that makes participation difficult.[13,17,93–97] Programs may choose to terminate services to a family if the program determines that it cannot meet a family's needs.

Participation in TANF is one marker of elevated family ESS risk. Prior research investigating the association between family risk factors and duration of enrollment in HV has found mixed results. Higher levels of risk factors overall have been associated both with longer[90,98–103,112] and shorter[101,104–106] durations of enrollment in HV. HV programs report difficulties in retaining families in services if they return to work, training programs, or school or disenroll from TANF.[61] TANF participation has not been empirically linked to duration of enrollment in HV, though increased economic risk specifically has been associated with a shorter duration of

enrollment in HV.[16,26,92,139] Families who struggle to find employment may have a shorter duration of enrollment in HV programs.[16]

HV can improve a wide array of health, cognitive, behavioral, and social outcomes for young children and their families, but effectiveness may be diminished when families do not receive the full set of recommended services.[3,11,42,81,83] Greater improvements in health and social indicators may be achieved when families remain enrolled in HV services for longer durations. The goal of this study was to investigate the association of elevated economic risk as indicated by TANF participation with duration of enrollment in HV. The study tested the hypothesis that TANF participation at enrollment was negatively associated with duration of enrollment in HV. A greater understanding of the relationship between family characteristics and continued enrollment in services may inform the design of interventions to increase family retention in HV.

Setting

New Jersey has a system of voluntary home visiting programs that enrolls nearly 5,000 families annually. Healthy Families America is one of three programs operating statewide in New Jersey and is the largest HV provider in the state.[57–59] Families who participate in HV in New Jersey display diverse needs and risk factors. In 2015, one-third of parents served by HV in New Jersey had not attained a high school diploma and nearly one-fifth of parents in the state lived below the federal poverty level.[84]

In New Jersey, the TANF program provides temporary assistance directly to families through cash transfers and also provides funding to HV to provide support services.[62,66,68]

In 2005, the New Jersey Department of Human Services partnered with Healthy Families America in New Jersey to create the Healthy Families-TANF Initiative for Parents with the goal of strengthening and supporting families who participate in both HV and TANF.[57,64,67] Through this initiative, the TANF program partially funds HV to provide ESS support services to families.[62,66,68] Families who are enrolled in both HV and TANF can use their HV participation to meet some or all of the TANF mandated employment-directed activity requirements until a child reaches one year of age.[67,69]

Methods

Study design

A retrospective cohort study assessed duration of enrollment up to one year for expectant women and mothers with a child under three years old who enrolled in Healthy Families New Jersey in 2014-2015.

Participants

Families were eligible for inclusion in the study if they enrolled in HFNJ between January 2014 and December 2015 and received at least one home visit. Families were comprised of an expectant woman or mother with a child under three years of age living in New Jersey. Families were screened by the HV program at enrollment to determine family needs and characteristics.[70] Families were offered HV services if they were determined by the program to be at risk for adverse social, economic, or health outcomes.

Data source

Study data were drawn from the Healthy Families New Jersey statewide administrative data system from 2014 to 2016. The data were collected during the first year of family enrollment in HV and included information about 1) family social, economic, and demographic characteristics at enrollment, and 2) home visit content and referrals.

Measures

Independent variable

TANF participation at enrollment: A dichotomous variable was created to indicate whether a family was identified as a TANF participant at intake or within one month of enrollment in HV.

Dependent variables

Reasons for attrition: Family reasons for attrition were reported as a categorical variable. Participant reasons for attrition included program completion, refusal of services, unavailability due to entering school or securing employment, loss of child custody, or death of parent, child, or fetus. The program may decide to disenroll a family if the family moved out of its geographical target area, if the program was unable to contact the family, or if the program lacked adequate resources to serve the family. Families who remained enrolled beyond one year were categorized as 'still enrolled.'

Duration of enrollment: Duration of enrollment was measured as the number of days from enrollment to the final home visit. For families who did not experience attrition, duration of enrollment was censored at 365 days.

The date of discharge from HV reported by the program is not necessarily the same as the date of the final home visit. Some families are disengaged from services but remain enrolled in HV while programs conducted creative outreach efforts to re-engage them.[140] Duration of enrollment may appear shorter in this study than other studies that used formal program enrollment data.[8,9,83,140]

Covariates

Variables were included as covariates in adjusted models if they: 1) had been included as a covariate in at least one randomized controlled trial of Healthy Families America determined to be of 'high quality' by the Home Visiting Evidence of Effectiveness; [131,132] 2) were available in the administrative data; 3) were significantly associated with at least one independent variable in bivariate analyses ($p<0.10$); 4) were not collinear with other variables (significance level of $R^2>0.40$ and $p<0.05$); and 5) were not missing in more than 10% of the sample.

Maternal demographic characteristics that met these criteria were: age at enrollment in HV, highest educational attainment, marital status, parity, primary language, poor maternal mental health, employment status, prenatal entry into HV, and maternal score on the Family Survey.

All covariates were present in administrative data. Age at enrollment in HV was calculated by subtracting the maternal birthdate from the date of enrollment and rounding to the last completed birthday. Maternal age was then categorized as <18, 18-24, 25-34, ≥35 years.

Family educational attainment was recorded as not completed high school, graduated high school, attended some college, or completed advanced training. Advanced training was comprised of vocational training, Associate's or Bachelor's degrees, or a graduate degree. Marital status was dichotomized as married or unmarried. An ordinal variable for parity was created to indicate whether families had zero children, one child, or more than one child. Families were considered to be primarily non-English speaking if they primarily spoke Spanish or a language other than English. A dichotomous variable for poor maternal mental health was created to indicate whether a mother was identified at assessment or enrollment to HV as having a) a history of depression or other mental illness, b) current depression, or c) current mental health service involvement. The child's birthdate or estimated date of delivery was compared with the date of enrollment in HV to designate whether families entered HV prenatally or postnatally. Overall family risk was determined by Family Survey score. The Family Survey is conducted before enrollment to HFNJ and is used to calculate an overall family risk score based on the assessment of a wide array of stressors. The risk factors assessed on the Family Survey include factors associated with increased risks of adverse health and social outcomes for children such as teen or first-time pregnancy, household poverty, inadequate prenatal care, unstable housing, social isolation, poor mental health, substance use, intimate partner violence, and previous reports of child abuse or neglect.[64,133] The Family Survey score increases in five unit increments as families are determined to be at low, medium, or high risk for each factor. Families who exhibit no risks receive a zero on the Family Survey. Families who score between 25 and 45 on the Family Survey are offered services to HFNJ. Families who score lower or higher may be offered enrollment at the discretion of the HFNJ site.[64]

Covariates ranged from 0%-6.9% missing values. Data were complete for 87.2% of the total sample. Only 3.0% of families were missing two or more covariates. Mean and mode imputation were performed to estimate values for missing data.[136]

Analyses

Univariate and bivariate descriptive statistics were calculated using proportions, means, standard deviations, Student's *t* tests, and chi-square statistics. Independent variables and covariates were tested for multicollinearity using Spearman's pairwise correlations. Total time at risk, incidence rates of attrition, and unadjusted Kaplan-Meier estimates of survival time were calculated for the total sample and for TANF participant vs. non-participant families. Unadjusted Cox proportional hazards models were constructed to test for differences in survival time by maternal TANF participation. Hazard ratios (HR) reported the relative risk of HV attrition in the next day for TANF participants and non-participants. Cox proportional hazard models were then adjusted for covariates and clustered by site. Adjusted Cox proportional hazards survival curves were plotted and equivalencies were compared using log-rank tests.[141,142] Based on prior research that identified differences between primarily English and non-English speaking families in HV,[21,26,114,115] the sample was stratified by primary language and the analyses were repeated. The proportional hazards assumption was checked for each model using plots, proportional hazards tests, and log-rank tests.

The Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health deemed this secondary data analysis to be not human subjects research.

Results

Family characteristics at enrollment in HV

The sample included 2,779 families. Of these families, 856 (30.8%) participated in TANF. Family characteristics varied by TANF participation (see Table 4.1). Only one-quarter of TANF participants enrolled prenatally, while 57.7% of TANF non-participants enrolled prenatally ($p<0.001$). A greater proportion of TANF participants were between 18-24 or 25-34 years old, while a greater proportion of non-participants were under 18 or over 35 years of age ($p<0.001$). A greater proportion of TANF participants were unmarried (90.3% vs. 75.8%, $p<0.001$), had graduated high school (72.3% vs. 63.1%, $p<0.001$), and were unemployed (89.5% vs. 74.7%, $p<0.001$). Nearly all TANF participants primarily spoke English, while just over half of TANF non-participants primarily spoke English (90.7% vs. 55.6%, $p<0.001$). On average, TANF participants scored 6.1 points higher on the Family Survey when compared to TANF non-participants ($p<0.001$). A higher proportion of TANF participants reported poor maternal mental health when compared to non-participants (44.5% vs. 36.9%, $p<0.001$).

Enrollment in the first year

TANF participants differed from TANF non-participants in their duration of enrollment and receipt of visits (see Table 4.2). On average, TANF participants were enrolled an average of 41 fewer days (175.0 vs. 216.0 days, $p<0.001$) and received 2.8 fewer visits than TANF non-participants (16.6 vs. 19.4 visits, $p<0.001$). Table 4.3 shows that a smaller percentage of TANF participants than non-participants were still enrolled in HV services at one year after enrollment (26.5% vs. 41.5% enrolled, $p<0.001$). Reasons for disenrollment differed between TANF participants and non-participants. A higher percentage of TANF participants refused services

after their initial visit (25.4% vs. 13.7% refused, p<0.001) or were unavailable to participate in HV due to enrolling in educational programs, gaining employment, meeting their goals for enrollment in the program, or graduating from HFNJ (16.4% vs. 11.4% unavailable, p=0.001) when compared with TANF non-participants.

Risk of attrition

In unadjusted models, TANF participation was associated with a 48% increase in the risk of attrition (HR 1.48, p<0.001; see Table 4.4), but after adjusting for covariates, there was no association between TANF participation and duration of enrollment in HV (p=0.81). Entering HV prenatally was associated with a 16% decrease in the risk of attrition when holding other variables constant (HR=0.84, p=0.002). Primarily speaking a language other than English was associated with a 36% decrease in the risk of attrition when holding other variables constant (HR=0.64, p<0.001).

Primarily non-English speaking families: For primarily non-English speaking families, participation in TANF was associated with 3.2 times the risk of attrition after adjusting for covariates (HR 3.24, p=0.05; see Table 4.5). Having attended at least some college was associated with a 38% increase in the risk of attrition (HR 1.38, p=0.05).

Among primarily English speaking families: Participation in TANF was not associated with the risk of attrition for primarily English speaking families after adjusting for covariates (p=0.99). Entering HV prenatally (HR=0.80, p<0.001) and being married (HR 0.78, p=0.02) were also

associated with approximately 20% decreases in the risk of attrition for primarily English speaking families.

The adjusted survival curves for the full sample and TANF participant and non-participant families are depicted in Figure 4.1.A. No significant differences were observed between the probabilities of retention in HV for TANF participants when compared with TANF non-participants. The adjusted survival curves for families by TANF participation and primary language are depicted in Figure 4.1.B. The log-rank test found that among primarily non-English speaking families, the probability of retention in HV was significantly lower for TANF participants when compared with TANF non-participants after adjusting for covariates and clustering by site ($p=0.001$).

Discussion

TANF participation was associated with a shorter duration of enrollment and fewer visits among families in the sample in unadjusted analyses. Only one-quarter of TANF participants remained enrolled for one year after enrollment compared with roughly 40% of TANF non-participants. This may be partially because a higher proportion of TANF participants refused services after their initial visit when compared to TANF non-participants. However, TANF participants were also more likely to leave HV because they entered an educational program, gained employment, or graduated the HV program.

After adjusting for covariates, TANF participation was not associated with the probability of retention in HV in this study except among primarily non-English speaking families. Differences in retention in HV were observed when comparing families across primary language spoken. Among primarily English-speaking families, participation in TANF was not associated with the risk of attrition from HV, but among primarily non-English speaking families, TANF participation was associated with over 3 times the risk of attrition. Other family characteristics were also associated with retention in services, and these varied based on primary language spoken.

The association of primarily speaking a language other than English with an increased duration of enrollment in HV is well-documented. Prior studies have found that Latina mothers specifically are more likely to enroll in HV[11,28,112,113] and remain enrolled for longer periods than African-American or European-American mothers.[21,26,114,115] In addition to parenting and family support, HV is often able to provide services that help non-English speaking immigrants integrate into primarily English speaking settings. Primarily non-English speaking families may continue their enrollment in HV because home visitors are often able to provide direct assistance or linkages to English language classes, translation or interpretation services, or immigration support.[30,109,115] Primarily non-English speaking families may be newer arrivals to the U.S. who are excluded from the wider network of social services because of residency or citizenship requirements. Among immigrants to the U.S., the model of home visitation may be familiar and trusted. Home visitors may resemble highly respected community health workers, or *promotoras*, which are prevalent in many immigrants' countries of origin.[32,116] Also, home

visitors may be perceived as surrogate extended family members for clients whose biological families may be separated by national borders.[30,109,115]

No studies were identified in the course of this research that investigated the association of TANF participation with duration of enrollment in HV among non-English speaking families. In this study, non-English speaking TANF participants exhibited a 50% increase in the risk of attrition when compared with non-English speaking TANF non-participants.

TANF participation among non-English speakers may serve as a proxy for other characteristics associated with duration of enrollment. Primarily non-English speaking families who choose to participate in TANF may hold cultural beliefs and norms that are more aligned with the messaging of U.S. social systems when compared to non-English speaking TANF non-participants. Families may remain enrolled in HV services for shorter durations if services are not well-aligned with family attitudes, knowledge, and beliefs. Among primarily non-English speaking families, TANF participants may have greater English literacy than TANF non-participants. Some HV programs may not offer services in primarily non-English speakers' native languages, which may be a barrier to continued enrollment in HV for families with lower levels of English literacy. TANF participation among primarily non-English speaking families may indicate willingness and ability to navigate the complex and mostly English-speaking system of applications, paperwork, and interviews necessary to enter social services. Families may also place less significance on their HV enrollment when they are more autonomous or if they are adequately supported by other social services programs such as TANF.[115]

Strengths and limitations

This study was undertaken to address the challenge of family retention articulated by HV programs themselves.[59] The study focused on two programs working in partnership to achieve well-aligned goals to improve family ESS. TANF participation and other family characteristics are likely to be accurately ascertained and recorded in New Jersey due to the existence of sophisticated, standardized, statewide management information system with continuous quality improvement initiatives for service delivery and data.

Several limitations are noted. Some unobserved measures, such as residential mobility or neighborhood poverty levels, may have improved the prediction of attrition. However, clustering by site may have reduced some of these geographic effects. Family or household income or wealth measures were not available in the data, nor were measures of current enrollment in educational programs. Some covariates were based on mothers' self-report to the home visitor. However, the proportion of families with risk factors in the study is similar to other studies that estimate prevalence at enrollment, indicating adequate ascertainment.[143] Less than 3% of the total sample were primarily non-English speaking and enrolled in TANF (n=75). Measures of acculturation or citizenship were not available in this study, but there may be important unobserved differences between primarily non-English speaking families across TANF participation status. Future studies of duration of enrollment in HV could be enhanced by including measures of acculturation, citizenship, family satisfaction with services, and partnership measures that were not available in these data.

Conclusion

Understanding the relationship between family characteristics and duration of enrollment is crucial to improve participation and outcomes for families in HV services. After adjusting for family characteristics, this study found that participation in TANF was associated with decreased duration of enrollment in HV for non-English speaking families, although this association was not found in English speaking families or in the sample as a whole. This study adds to the evidence base that investigates duration of family enrollment in home visiting specifically and social services more generally.

HV serves families who live with social, economic, biologic, and behavioral health adversity. These findings should be interpreted in light of the complex challenges faced by families in HV. Many HV families participate in TANF, but challenging circumstances beyond this economic risk factor may exert greater influence on duration of enrollment in HV. To reduce attrition, HV programs may want to improve their outreach and retention efforts for families known to engage in HV for shorter durations of enrollment such as TANF participants. To maximize outcomes among families, HV programs may want to focus on enrolling subgroups such as non-English speaking TANF non-participants who are known to remain enrolled in services longer. These findings may inform the design of interventions to improve HV outreach, services, and retention efforts.

Table 4.1: Characteristics of families enrolling in HFNJ in 2014-2015

Characteristic	All *n* = 2,779	TANF Participant *n* = 856	TANF Non-participant *n* = 1,923	*p*
TANF participant, %	30.8	-	-	
Maternal age (years), %				
<18	4.4	1.5	5.7	<0.001
18-24	37.2	46.3	33.2	
25-34	46.5	45.4	47.0	
≥35	11.8	6.8	14.1	
Child age, mean (SD)*	84.4 (57.7)	113.2 (57.8)	64.1 (48.3)	<0.001
Enrolled prenatally, %	52.4	25.0	57.7	<0.001
Parity, %				
0	16.3	2.2	22.6	<0.001
1	38.2	40.4	37.2	
≥ 2	38.6	52.0	32.7	
Missing	6.9	5.4	7.5	
Marital status, %				
Unmarried	80.2	90.3	75.8	<0.001
Missing	4.5	4.0	4.7	
Education, %				
< High school graduate	35.1	28.7	37.9	<0.001
High school or GED	33.5	42.6	29.5	
Some college	15.4	15.4	15.3	
≥ Vocational school or Associate's degree	12.9	9.7	14.3	
Unknown	3.1	3.5	3.0	
Mother employed, %	17.3	6.8	21.9	<0.001
Missing	3.5	3.7	3.4	
Race/ethnicity, %				
Non-Hispanic, white	13.7	14.6	13.3	0.23
Non-Hispanic, black	26.1	25.2	26.5	
Hispanic/Latina	39.4	35.8	41.0	
Other/multiracial	6.0	5.0	6.5	
Missing	14.8	19.4	12.7	
Language, %				
English	66.0	90.7	55.0	<0.001
Spanish	31.6	8.6	41.8	
Other	1.8	0.2	2.6	
Missing	0.6	0.5	0.6	
Family Survey score, mean (SD)	31.4 (14.0)	35.6 (13.4)	29.5 (13.9)	<0.001
Poor maternal mental health, %	39.2	44.5	36.9	<0.001

Note: Child age calculated only for families entering postnatally.

Table 4.2: Duration of enrollment and number of visits in the first year for families enrolling in HFNJ in 2014-2015, by TANF participation

	All (%) *n* = 2,779	TANF		*p*
		Participant *n* = 856	Non-participant *n* = 1,923	
Duration of enrollment				
Mean days	203.3	175.0	216.0	<0.001
SD	140.6	136.9	140.4	
Number of visits				
Mean visits	18.5	16.6	19.4	<0.001
SD	13.7	13.4	13.7	

Table 4.3: Percentages enrolled and not enrolled and reasons for attrition at one year after enrollment in HFNJ in 2014-2015, by TANF participation

	All (%) *n* = 2,779	TANF (%) Participant *n* = 856	TANF (%) Non-participant *n* = 1,923	*p*
Still enrolled	36.9	26.5	41.5	<0.001
Not enrolled	63.1	73.5	58.5	
Refused services	17.3	25.4	13.7	<0.001
Unavailable due to educational enrollment or employment; Met goals/graduated from HFNJ	13.0	16.4	11.4	<0.001
Death of fetus, child, or parent; Child placed in foster care; Child adopted by another family	1.7	1.5	1.8	0.30
Lost to follow-up	15	13.6	15.7	0.18
Moved out of program target area	9.6	9.5	9.7	0.78
Transfer to Another Program	1.5	1.4	1.5	0.54
Program refused or unable to provide services	0.4	0.6	0.4	0.45
Missing or none reported	4.6	5.3	4.3	0.29

Table 4.4: Hazard ratios for risk of attrition for families enrolling in HFNJ in 2014-2015

Predictor	**HR**	**95% CI**	***p***
Unadjusted			
TANF participation	1.48	1.34-1.63	<0.001
Adjusted			
TANF participation	1.05	0.68-1.61	0.81
Poor maternal mental health	0.94	0.84-1.04	0.24
Maternal age	0.97		
<18	reference		
18-24	0.91	0.61-1.37	0.67
25-34	0.71	0.38-1.33	0.28
≥35	0.51	0.20-1.30	0.16
Prenatal entry to program	0.84	0.76-0.94	0.002
Family Survey score	1.00	1.00-1.00	0.99
Current maternal employment	1.03	0.901-1.18	0.67
Primarily non-English speaking	0.64	0.56-0.73	<0.001
Parity			
0	reference		
1	0.95	0.81-1.10	0.51
≥ 2	1.02	0.87-1.20	0.81
Married	0.88	0.75-1.03	0.10
Educational level			
< High school graduate	reference		
High school graduate or GED	0.96	0.85-1.08	0.47
Some college	0.99	0.85-1.16	0.92
≥ Vocational school or Associate's degree	0.88	0.74-1.04	0.13
Model $p>\chi^2$			<0.001

Table 4.5: Hazard ratios for risk of attrition for families enrolling in HFNJ in 2014-2015, by primary language

Predictors	Primarily non-English speaking		Primarily English speaking	
Unadjusted	**HR**	***p***	**HR**	***p***
TANF participation	1.89	<0.001	1.23	≤0.001
Adjusted	**HR**	***p***	**HR**	***p***
TANF participation	3.24	0.05	0.99	0.99
Poor maternal mental health	1.10	0.41	0.90	0.07
Maternal age				
<18	reference			
18-24	0.58	0.25	0.94	0.80
25-34	0.28	0.13	0.71	0.36
≥35	0.13	0.09	0.50	0.20
Prenatal entry to program	0.93	0.48	0.80	<0.001
Family Survey score	1.00	0.85	1.00	0.78
Current maternal employment	1.14	0.29	1.01	0.84
Parity				
0	reference			
1	0.80	0.14	1.01	0.94
≥ 2	0.78	0.13	1.10	0.32
Married	0.92	0.49	0.78	0.02
Educational level				
< High school graduate	reference			
High school graduate or GED	1.05	0.65	0.88	0.08
Some college	1.38	0.05	0.87	0.14
≥ Vocational school or Associate's degree	0.77	0.14	0.86	0.13
Model $p>\chi^2$		<0.001		<0.001

Figure 4.1: Probability of continued enrollment in the first year for families enrolling in HFNJ in 2014-2015 by A) TANF participation and B) by TANF participation and primary language

Figure 4.1.A: Probability of continued enrollment for families enrolling in HFNJ in 2014-2015, by TANF participation

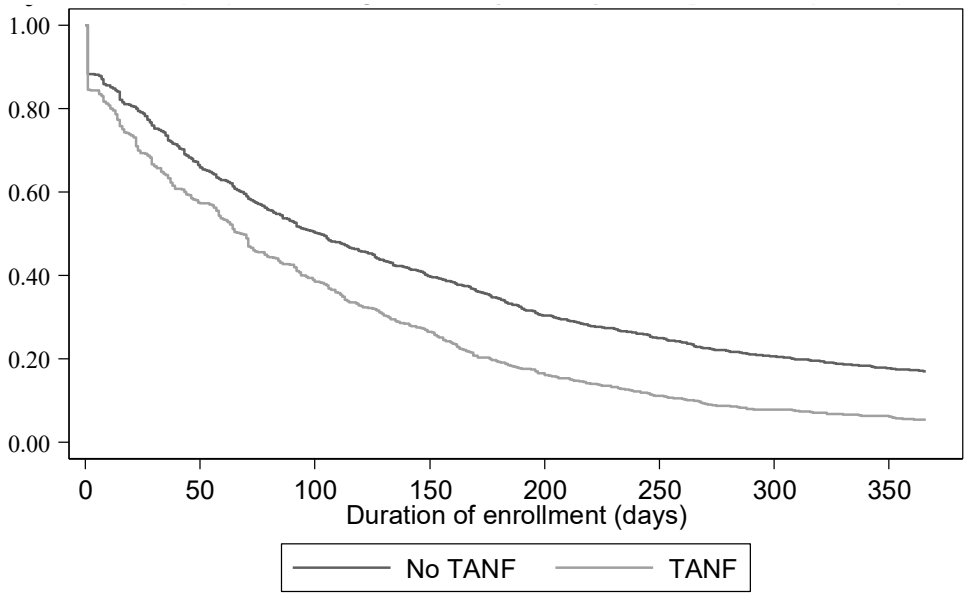
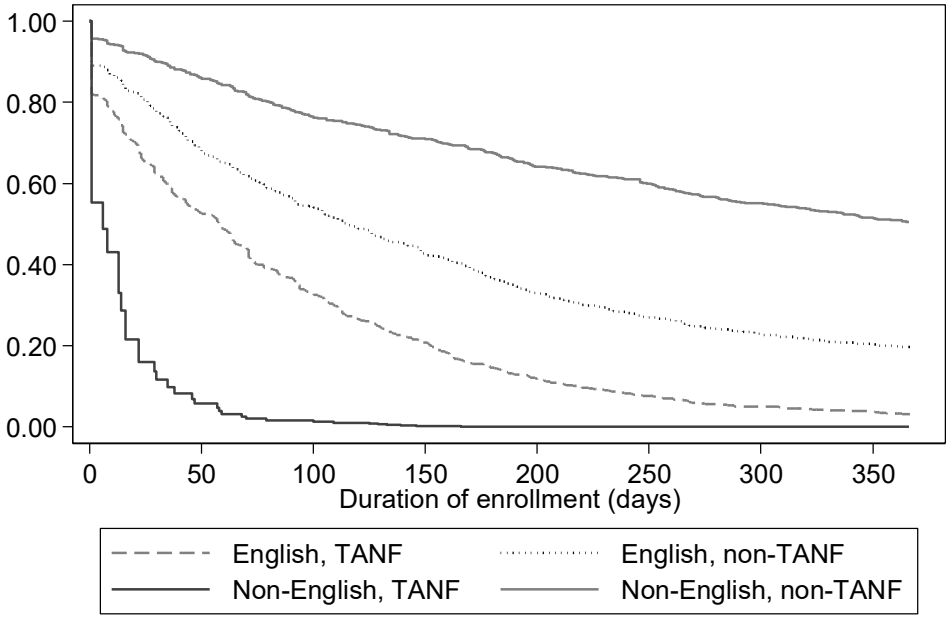


Figure 4.1.B: Probability of continued enrollment for families enrolling in HFNJ in 2014-2015, by TANF participation and primary language



Figures 4.1.A and 4.1.B adjusted for maternal age, prenatal entry, Family Survey score, current employment, parity, marital status, and education. Figure 4.1.A also adjusted by primary language. Clustered by site.
Note: Non-English, TANF curve depicted Figure 4.1.B based off comparatively small sample (n=75). Other groups: Non-English, non-TANF (n=854), English, TANF (n=781), and English, non-TANF (n=1,069).

Chapter 5: Association of Participation in Temporary Assistance for Needy Families with Receipt of Economic Self-Sufficiency Home Visiting Services

Chapter 5: Association of Participation in Temporary Assistance for Needy Families with Receipt of Economic Self-Sufficiency Home Visiting Services

Abstract

Objectives: Home visiting (HV) provides services to diverse families, but little is known about how services vary based on family needs. The goal of this study was to investigate the association of participation in Temporary Assistance for Needy Families (TANF) with economic self-sufficiency (ESS) services delivered to families during their first year of enrollment in HV.

Methods: A retrospective cohort study assessed the receipt of ESS services by expectant women and mothers with a child under three years old in Healthy Families New Jersey in 2014-2015. Economic risk was indicated by participation in TANF. ESS services included educational, employment, and financial content and referrals. Survival analyses compared the time to receipt of ESS services in the first year of enrollment in HV for families who participated versus did not participate in TANF. Models were clustered by site and adjusted for family characteristics at enrollment.

Results: During the study period, 2,779 families entered HV. Of these, 856 families participated in TANF (31.0%). Overall, 27.2% of families received ESS services in their first three months of enrollment, and half (49.5%) received ESS services in the first year of enrollment. Adjusted models showed no difference in the rate of ESS service receipt when comparing TANF participants to non-participants (p=0.51). However, family characteristics such as

primary language spoken, prenatal entry to HV, being married, and graduating high school were associated with rates of ESS service receipt for TANF non-participants.

Conclusion: Few families receive ESS services in their first three months or year of enrollment in HV. TANF participation was not associated with rates of ESS service receipt. Other family characteristics may influence access to ESS services for families who are not enrolled in other social services such as TANF. The findings of this study may be used to improve the selection of services delivered to families in HV who exhibit diverse characteristics. The study highlights an opportunity for HV and TANF to better align their services to help families achieve ESS goals.

Introduction

Many children in the United States are born into circumstances that compromise their health, education, and welfare. Home visiting (HV) can improve a wide array of health and social outcomes for young children and their families.[2–5] HV programs aim to improve outcomes for expectant families and families with young children through direct services and referrals to other community resources. In home visits, home visitors are paired with families to engage in shared goal-setting and curriculum-based activities that support family asset-building. Services provided to families in HV typically include health screenings, parent support and coaching, goal-setting, curriculum-based activities, and referring or linking families to community health and social resources.

In 2016, 160,000 parents and children were served by HV programs in the U.S.[1] HV in the United States usually serves families experiencing behavioral, health, parenting, or social adversity.[46] Families who participate in HV often live in challenging circumstances that include limited economic self-sufficiency (ESS), characterized by low educational attainment, poverty, and unemployment. Of families who were eligible for HV in 2015, 13% had not completed high school, more than one-quarter of families lived below the federal poverty threshold, and approximately 30% had no parent who was employed full-time.[84] Families who participated in the Mother and Infant Home Visiting Program Evaluation (MIHOPE), a large-scale randomized controlled trial that includes 4,450 families across twelve states, exhibited the following ESS risks: three-quarters of families had attained a high school diploma or less; more than one-fifth of families in HV had not been employed in the prior three years; more than 90% of families were supported by some public assistance; and more than one-fifth of families participated in TANF.[88]

Research into HV has found significant benefits for young children with regard to child abuse prevention, language and cognition, and prevention of myriad health and behavioral problems.[2–5,12] Improvements in outcomes are more likely and of greater magnitude when existing family assets are leveraged to address identified needs.[42,46,82] Families at enrollment in HV differ in their parenting risks, assets, goals, and expectations of programs, so services are expected to exhibit some variation. Home visitors are encouraged to varying degrees by their local leadership and national models to align services to family characteristics,[22,27,119,125] but this approach can be challenging if a family's needs extend beyond a program's intended reach or if the program prioritizes outcomes that are different from those of families.

Service tailoring occurs when services, defined as visit content and referrals to community resources, align with family assets and risks. Services are tailored through purposeful variation in a program's intended model and services as they are adapted to family characteristics through ongoing shared decision making and agenda setting.[13,16,18–21,23,117,118] Home visiting research typically focuses on aggregate family outcomes and services delivered and does not investigate tailoring of services to address specific family characteristics.[27–30] Evaluations of HV report variability in sites' delivery of program content and referrals.[24,74,112,126] A review of 20 randomized trials of home visiting programs reported that only 40% provided any description of services provided to families.[83] However, evidence suggests that satisfaction with services increases as content becomes more individualized, and this may then promote continued enrollment and greater improvements in outcomes.[17,22–26,35–37]

Setting

TANF in New Jersey: New Jersey provides child development and family support services through a network of interconnected programs. TANF provides cash transfers directly to families in exchange for participation in activities that promote ESS. Families are eligible for TANF if they meet specific requirements that include: 1) exhibiting urgent education, employment, or financial needs; 2) parenting a child under the age of 18; and 3) possessing U.S. citizenship or at least five years of uninterrupted legal resident status.[68,69] TANF participants are required to achieve educational and employment goals established by the State of New Jersey's employment readiness standards through participation in education, employment, financial, and other supportive services.[67,69,144,145]

HV in New Jersey: New Jersey has a system of voluntary home visiting programs that enrolls nearly 5,000 families annually. Families who participate in HV in New Jersey display diverse needs and risk factors. In 2015, one-third of parents served by HV in New Jersey had not attained a high school diploma and nearly one-fifth of parents in the state lived below the federal poverty level.[84] New Jersey is required to show improvements in ESS and other outcomes for families served by HV programs that receive funds from the federal Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program.[38,146]

Healthy Families-TANF Initiative for Parents: Healthy Families America is the largest of three state-administered HV programs operating in New Jersey.[57–59] In 2005, the New Jersey Department of Human Services partnered with Healthy Families America in New Jersey to create the Healthy Families-TANF Initiative for Parents with the goal of strengthening and

supporting families who participate in both HV and TANF.[57,64,67] Through this initiative, the TANF program partially funds HV with the caveat that HV programs must provide ESS services to mothers who participate in TANF.[62,66,68,147] Families who are enrolled in both HV and TANF can use their HV participation to meet some or all of the TANF mandated employment-directed activity requirements until a child reaches one year of age.[67,69]

Whether and how services might be tailored to improve outcomes for families requires a greater understanding of the relationship of family characteristics at enrollment with services subsequently delivered. The extent to which services address ESS, and the differentiation of services for families who participate and do not participate in TANF, is unknown. The goal of this study was to better understand the ESS content and referrals delivered to families early in their enrollment in HV and the ways that services were tailored to family ESS risk evidenced by TANF participation at enrollment.

Methods

Study design

A retrospective cohort study assessed whether and when families received ESS services during their first year of enrollment in HV. The study described the ESS content and referrals provided to families and tested the association of TANF participation with receipt of services tailored to ESS.

Participants

Families were eligible for inclusion in the study if they enrolled in HV between January 2014 and December 2015 and received at least one home visit. Families were comprised of an expectant woman or mother living in New Jersey with a child under three years of age. Families were screened by the HV program to determine family needs and characteristics.[70] Families were offered HV services if they were determined by the program to be at risk for adverse social, economic, or health outcomes.

Data source

Study data were drawn from the Healthy Families New Jersey statewide administrative data system from 2014 to 2016. The data were collected during the first year of family enrollment in HV and included information about 1) family social, economic, and demographic characteristics at enrollment, and 2) home visit content and referrals.

Measures

Independent variable

TANF participation: A dichotomous variable was created to indicate whether a family participated in TANF at intake or within one month of enrollment in HV.

Dependent variables

ESS services

Families were determined to have received ESS services if, in the course of at least one home visit, the home visitor performed one or more of the following behaviors related to:

ESS content: 1) Provided information on educational and training options; 2) Discussed employment and training; 3) Provided employment information and/or helped parent(s) look for job; 4) Discussed household income and/or financial literacy; or 5) Provided information and/or assistance on ESS.

ESS referrals: Provided at least one referral to: 1) adult basic education, GED preparation, special education, college, or other educational services; 2) job readiness and/or employability skills, job search and placement assistance, work experience, One-Stop Career Center, or vocational or job skills training; or 3) money management service.

ESS services in the first three months or year after enrollment: Dichotomous variables were created to indicate whether a family received ESS services within three months of enrollment and within one year of enrollment in HV. A family was considered to have received ESS services if it received education, employment, or financial content or referrals in at least one visit. See Table I.1 in Appendix I for the distribution of each discussion topic and referral considered an ESS service.

Time to receipt of ESS services: A continuous variable was created to count the number of days from enrollment to the first instance of receipt of ESS services. Three additional variables were also created to count the number of days to first receipt of education, employment, and financial services specifically. Families who did not receive ESS services in the first year of enrollment were censored at 365 days.

Covariates

Variables were included as covariates in adjusted models if they: 1) had been included as a covariate in at least one randomized controlled trial of Healthy Families America determined to be of 'high quality' by the Home Visiting Evidence of Effectiveness;[131,132] 2) were available in the administrative data; 3) were significantly associated with at least one independent variable in bivariate analyses ($p<0.10$); 4) were not collinear with other variables (significance level of $R^2>0.40$ and $p<0.05$); and 5) were not missing in more than 10% of the sample.

Maternal demographic characteristics that met these criteria were: age at enrollment in HV, highest educational attainment, marital status, parity, primary language, poor maternal mental health, employment status, prenatal entry into HV, and maternal score on the Family Survey.

All covariates were present in administrative data. Age at enrollment in HV was calculated by subtracting the maternal birthdate from the date of enrollment and rounding to the last completed birthday. Maternal age was then categorized as <18, 18-24, 25-34, ≥35 years. Family educational attainment was recorded as not completed high school, graduated high school, attended some college, or completed advanced training. Advanced training was comprised of vocational training, Associate's or Bachelor's degrees, or a graduate degree. Marital status was dichotomized as married or unmarried. An ordinal variable for parity was created to indicate whether families had zero children, one child, or more than one child. Families were considered to be primarily non-English speaking if they primarily spoke Spanish or a language other than English. A dichotomous variable for poor maternal mental health was created to indicate whether a mother was identified at assessment or enrollment to HV as having a) a history of

depression or other mental illness, b) current depression, or c) current mental health service involvement. The child's birthdate or estimated date of delivery was compared with the date of enrollment in HV to designate whether families entered HV prenatally or postnatally. Overall family risk was determined by Family Survey score. The Family Survey is conducted before enrollment to HFNJ and is used to calculate an overall family risk score based on the assessment of a wide array of stressors. The risk factors assessed on the Family Survey include factors associated with increased risks of adverse health and social outcomes for children such as teen or first-time pregnancy, household poverty, inadequate prenatal care, unstable housing, social isolation, poor mental health, substance use, intimate partner violence, and previous reports of child abuse or neglect.[64,133] The Family Survey score increases in five unit increments as families are determined to be at low, medium, or high risk for each factor. Families who exhibit no risks receive a zero on the Family Survey. Families who score between 25 and 45 on the Family Survey are offered services to HFNJ. Families who score lower or higher may be offered enrollment at the discretion of the HFNJ site.[64]

Covariates ranged from 0%-6.9% missing values. Data were complete for 87.2% of the total sample. Only 3.0% of families were missing two or more covariates. Mean and mode imputation were performed to estimate values for missing data.[136]

Analyses

Univariate and bivariate descriptive statistics were calculated using proportions, means, standard deviations, Student's *t* tests, and chi-square statistics. Unadjusted Cox proportional hazards models were constructed to test for differences in time to receipt of ESS services when

comparing TANF participant and non-participant families. Hazard rates were constructed to calculate the probability of receiving an ESS service at a given time assuming that a family had not yet received an ESS services until that time. The hazard rates of TANF participants and non-participants were used to calculate unadjusted hazard ratios that report the relative risks of receiving ESS services. Unadjusted hazard ratios were then adjusted for covariates and clustered by site using the Cox proportional hazards regression model. The analyses were then repeated after stratifying by TANF participation and after restricting the time period to the first three months of enrollment. Unadjusted and adjusted Cox proportional hazards survival curves were plotted and equivalencies were compared using log-rank tests.[141,142] The proportional hazards assumption was checked for each model using plots, proportional hazards tests, and log-rank tests.

The Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health deemed this secondary data analysis to be not human subjects research.

Results

Sociodemographic characteristics of families

The study sample included 2,779 families who enrolled in HFNJ from 1/1/2014-12/31/2015. Of families in the sample, 856 (30.8%) participated in TANF. Demographic and social characteristics of families varied by TANF participation (see Table 5.1). A greater proportion of TANF participants were between 18-24 or 25-34 years old, while a greater proportion of non-participants were under 18 or over 35 years of age ($p<0.001$). One-quarter of TANF participants

enrolled prenatally, while 57.7% of TANF non-participants enrolled prenatally ($p<0.001$). A greater proportion of TANF participants than TANF non-participants were unmarried (90.3% vs. 75.8%, $p<0.001$) and had graduated high school but not enrolled in additional training (42.6% vs. 29.5%, $p<0.001$). A smaller proportion of TANF participants were employed (10.5% vs. 25.3%, $p<0.001$). Most TANF participants primarily spoke English (90.7%), while only 55.0% of TANF non-participants primarily spoke English ($p<0.001$).

Receipt of services by TANF participation

Families in the sample received 51,539 unique home visits and 9,864 unique referrals for ESS services. ESS content was provided in 15,928 (30.9%) visits in total. Of these visits containing ESS content, 3,483 (6.8%) included education content; 9,143 (17.7%) included employment content; 8,695 (16.9%) included financial content; and 463 (0.9%) included all three types.

A higher proportion of TANF participants than non-participants received any ESS service in the first three months after enrollment (29.7% vs. 26.1%, $p=0.05$; see Table 5.2). The observed marginal difference in ESS service receipt may be attributable to a higher proportion of TANF participants receiving education services in particular during the first three months (19.7% vs. 16.8% receiving, $p=0.06$). However, this small difference in receipt of ESS services did not persist at one year after enrollment ($p=0.71$). In the first three months, TANF participants did not differ from non-participants in their receipt of financial services ($p=0.99$). By the end of the first year, however, a lower proportion of TANF participants had received financial services when compared to non-participants (21.6% vs. 25.7%, $p=0.02$).

On average, TANF participants received ESS services sooner than TANF non-participants (44.0 vs. 57.5 days, $p<0.001$; see Table 5.2). Of these services, TANF participants received education (52.9 vs. 78.0 days, $p<0.001$) and employment (87.9 vs. 100.5 days, $p=0.04$) services sooner after enrollment than TANF non-participants. No difference was observed in the time to receipt of financial services.

Rate of ESS service receipt

TANF participation was not associated with the rate of ESS service receipt in the unadjusted model ($p=0.50$; see Table 5.3). After adjusting for covariates, TANF participation was not associated with the rate of ESS service receipt ($p=0.51$). Family characteristics associated with a decrease in the rate of ESS service receipt included prenatal entry to the program (18% decrease, HR 0.82, $p<0.001$), primarily speaking a language other than English (22% decrease, HR 0.78, $p<0.001$), and completing high school but not going on to further education (16% decrease, HR 0.84, $p=0.01$). Being married was associated with an 18% increase in the rate of ESS services (HR 1.18, $p=0.03$).

The sample was stratified by TANF participation and the survival analysis was repeated (see Table 5.4). For families who participated in TANF, no covariates were associated with the rate of ESS service receipt. For families who did not participate in TANF, entering the program prenatally (HR 0.80, $p<0.001$) and primarily speaking a language other than English (HR 0.80, $p<0.001$) were associated with 20% decreases in the rate of ESS receipt when holding other variables constant. High school but no further education was associated with a 15% decrease in the rate of ESS service receipt (HR 0.85, $p=0.04$). Being married was associated with a 21%

increase in the rate of ESS service receipt for TANF non-participants when holding other variables constant (HR 1.21, p=0.03).

Discussion

The goal of this study was to better understand the association of TANF participation with the ESS services delivered to families. Families enrolled in HV exhibit heightened ESS risks,[7,28,37,40–42,74–83,88] but only half of families received any services related to education, employment, or finance in the first year after enrollment. The study hypothesized that a higher proportion of TANF participants would receive ESS services when compared to non-participants, and ESS services would be received sooner after enrollment. TANF participants were expected to receive ESS services soon after enrollment because of the strong partnership between HV and TANF in New Jersey focused specifically on improving family ESS.[147] However, after adjusting for other family characteristics, TANF participation was not associated with the receipt of services tailored to ESS in the first three months or first year of enrollment.

This study used TANF participation as a marker for urgent education, employment, and financial needs. Participation in TANF may be only one of many markers that indicate severe family ESS risk. Families who participate in TANF may not in fact have more ESS needs than families who do not participate in TANF. By receiving cash transfers through TANF, family economic needs may be partially, although temporarily, met. Families may receive ESS services through TANF, so they may not need this type of service to also be provided by HV. This study only examined ESS service receipt in the first year of enrollment, but families may have greater motivation to

pursue ESS goals if their two-year limit on TANF support nears or if they approach their five year lifetime cap on TANF receipt. Families may also receive ESS services and support through programs other than HV and TANF. Families who participate in TANF may be more likely to be enrolled in other social support services besides HV and TANF that provide ESS services. When families are supported by other programs in strengthening ESS, they have more time to dedicate to other topics during the course of home visits.

Family characteristics that encourage or hinder the delivery of ESS services must be considered to better understand these observed differences. Among TANF participants, no family characteristics tested by the study were associated with ESS service receipt. However, among TANF non-participants, decreased rates of ESS services were observed in families who spoke a language other than English, entered prenatally, completed high school but not further education, and were unmarried. TANF non-participants with characteristics associated with lower rates of ESS services may be less likely to need or want ESS services. However, there may be other reasons that these families received ESS services later or not at all.

TANF non-participation may be associated with lower levels of English fluency among primarily non-English speakers. TANF participation among primarily non-English speaking families may be an indicator of a greater ability to navigate the complex and mostly English-speaking system of applications, paperwork, and interviews necessary to enter social services. Home visitors may not be able to communicate easily with families in their caseload if they are not from the same linguistic background, and therefore may be less likely to deliver content or referrals that require complicated conceptual or instructional exchanges. Some HV programs may not offer ESS

services in primarily non-English speakers' native languages, or referrals may not be useful to families if they do not offer multilingual services. Families who do not primarily speak English may not be able to access the referrals that HV programs provide if these external agencies do not provide services in the languages spoken by families.

Participation in TANF may also be a marker of immigration and social integration. In addition to parenting and family support, HV is often able to provide services that help non-English speaking immigrants integrate into primarily English speaking settings. Primarily non-English speaking families may be newer arrivals to the U.S. who have needs that extend beyond ESS services. Home visitors may choose to deliver content or referrals focusing on topics such as English language fluency, translation or interpretation services, or immigration support to these families.[30,109,115] Families who are primarily non-English speaking and not integrated into other social services may vary in their interest in ESS services due to different cultural norms around working or going to school as a mother. Primarily non-English speaking families may not be eligible for TANF due to residency or citizenship requirements. Families who are not eligible for TANF may also be ineligible for some of the educational opportunities and employment content or referrals provided by HV.

Other characteristics such as prenatal enrollment, educational attainment, and marital status were also associated with decreased or delayed receipt of ESS services for TANF non-participants. TANF non-participants may be disconnected from social services generally. Among TANF non-participants, prenatally enrolling families may prefer to focus their time in services on pregnancy, preparing for a new baby, and childbirth, especially if they do not receive this

information from other social services. Among TANF non-participants, being married was associated with receiving ESS services. Married families may be more receptive to ESS services because having two adults in the household may increase family availability to engage in ESS activities. Single parents may not have time to pursue the employment or educational opportunities that HV promotes via ESS services. Families who have completed high school but no more education and do not participate in TANF have met the minimum bar for many careers. If families do not want to continue their educations or have competing needs, home visitors may focus HV services on other topics.

Strengths and limitations

This study should be interpreted in context of its strengths and limitations. The study focused on two programs working in partnership to achieve well-aligned goals to improve family ESS. TANF participation and other family characteristics are likely to be accurately ascertained and recorded in the HV program due to the existence of sophisticated, standardized, statewide management information system with continuous quality improvement initiatives for service delivery and data.

Several limitations are noted. Dosage of ESS services received, such as the proportion of visits that included ESS services, was not included in this study. Some unobserved measures, such as the availability of referral resources in a community or site-specific home visitor training, may have influenced the delivery of services to families. However, clustering analyses by site may have reduced some of these effects. Family or household income or wealth measures were not available in the data, nor were measures of current enrollment in educational programs.

Measures of acculturation, immigration status, and citizenship were not available in this study, but there may be important unobserved differences between primarily non-English speaking families across TANF participation status. The measure of primary language was based on mothers' self-report to the home visitor, but English proficiency levels were not available in the data. Qualitative data about families' self-identified needs, inclusion in selecting visit activities, and satisfaction with services may enhance future studies that investigate HV service delivery.

Conclusion

Less than one-third of families received ESS services in their first three months of enrollment, and only half of families received ESS services after one year of enrollment. Few families enrolling in HV received ESS services. Family characteristics may act as a barrier or facilitator to the delivery of services. After adjusting for family characteristics, TANF participants did not differ from non-participants in their rates of receipt of ESS services. Families who have lower rates receipt of ESS services may have needs or priorities other than family ESS.

Family ESS is a high priority outcome for both HV and TANF, and both programs are required to show ESS improvements among their enrollees.[38,146] The findings of this study may be used to strengthen the alignment of HV and TANF priorities to help families achieve ESS goals. This study adds to the evidence base that investigates the delivery of services to families in HV. All families enrolling in HV may experience challenges related to education, employment, and finance. HV programs may want to focus on delivering ESS services to families who have characteristics associated with decreased rates of ESS service receipt. Understanding what

services are delivered to families early in their enrollment in HV is a critical step to establish causality in changes observed in family needs at enrollment and family outcomes at discharge. The findings of this study may inform the choice of services that are responsive to the diverse characteristics of families enrolled in home visiting. The study highlights an opportunity for HV and TANF to strengthen the alignment of their services to help families achieve ESS goals.

Table 5.1: Characteristics of families enrolling in HFNJ in 2014-2015

Characteristic	All *n* = 2,779	TANF Participant *n* = 856	TANF Non-participant *n* = 1,923	*p*
TANF participant, %	30.8	-	-	
Maternal age (years), %				
<18	4.4	1.5	5.7	<0.001
18-24	37.2	46.3	33.2	
25-34	46.5	45.4	47.0	
≥35	11.8	6.8	14.1	
Child age, mean (SD)*	84.4 (57.7)	113.2 (57.8)	64.1 (48.3)	<0.001
Enrolled prenatally, %	52.4	25.0	57.7	<0.001
Parity, %				
0	16.3	2.2	22.6	<0.001
1	38.2	40.4	37.2	
≥ 2	38.6	52.0	32.7	
Missing	6.9	5.4	7.5	
Marital status, %				
Unmarried	80.2	90.3	75.8	<0.001
Missing	4.5	4.0	4.7	
Education, %				
< High school graduate	35.1	28.7	37.9	<0.001
High school or GED	33.5	42.6	29.5	
Some college	15.4	15.4	15.3	
≥ Vocational school or Associate's degree	12.9	9.7	14.3	
Unknown	3.1	3.5	3.0	
Mother employed, %	17.3	6.8	21.9	<0.001
Missing	3.5	3.7	3.4	
Race/ethnicity, %				
Non-Hispanic, white	13.7	14.6	13.3	0.23
Non-Hispanic, black	26.1	25.2	26.5	
Hispanic/Latina	39.4	35.8	41.0	
Other/multiracial	6.0	5.0	6.5	
Missing	14.8	19.4	12.7	
Language, %				
English	66.0	90.7	55.0	<0.001
Spanish	31.6	8.6	41.8	
Other	1.8	0.2	2.6	
Missing	0.6	0.5	0.6	
Family Survey score, mean (SD)	31.4 (14.0)	35.6 (13.4)	29.5 (13.9)	<0.001
Poor maternal mental health, %	39.2	44.5	36.9	<0.001

Note: Child age calculated only for families entering postnatally.

Table 5.2: ESS service receipt in the first three months and first year for families enrolling in HFNJ in 2014-2015, by TANF participation

	All *n* = 2,779	TANF Participants *n* = 856	TANF Non-participants *n* = 1,923	*p*
Any economic self-sufficiency services, %				
First three months	27.2	29.7	26.1	0.05
First year	49.5	50.0	49.2	0.71
Education[Ŧ] services, %				
First three months	17.7	19.7	16.8	0.06
First year	34.1	35.0	33.7	0.49
Employment[Ψ] services, %				
First three months	7.6	8.6	7.1	0.16
First year	23.0	24.2	21.9	0.18
Financial[λ] services, %				
First three months	8.0	7.9	8.0	0.99
First year	24.5	21.6	25.7	0.02
Mean days to first receipt				
Any financial self-sufficiency services	53.4	44.0	57.5	<0.001
Education[Ŧ]	70.0	52.9	78.0	<0.001
Employment[Ψ]	96.7	87.9	100.5	0.04
Financial[λ]	86.3	79.6	88.9	0.12

[Ŧ] Education services include: Provide information on educational and training options; Referral to adult basic education, GED preparation, special education, college, or other educational services

[Ψ] Employment services include: Discuss employment and training; Provide employment information and/or help parent(s) look for job; Referral to job readiness and/or employability skills, job search and placement assistance, work experience, One-Stop Career Center, or Vocational or job skills training

[λ] Family economic self-sufficiency services include: Discuss household income and/or financial literacy; Provide information and/or assistance on economic self-sufficiency; Referral to money management service

Table 5.3: Hazard ratios for rate of receipt of ESS services for families enrolling in HFNJ in 2014-2015

Predictor	HR	95% CI	*p*
Unadjusted			
TANF	1.03	0.92-1.16	0.50
Adjusted			
TANF	1.05	0.92-1.20	0.51
Primarily non-English speaking	0.78	0.68-0.89	<0.001
Poor maternal mental health	0.98	0.88-1.11	0.80
Maternal age			
<18	reference		
18-24	1.03	0.78-1.36	0.83
25-34	1.01	0.76-1.34	0.94
≥35	0.96	0.70-1.31	0.78
Prenatal entry to program	0.82	0.73-0.91	<0.001
Family Survey score	1.00	1.00-1.01	0.06
Current maternal employment	0.98	0.85-1.13	0.76
Parity			
0	reference		
1	1.00	0.85-1.17	0.99
≥2	0.97	0.82-1.15	0.71
Married	1.18	1.02-1.38	0.03
Educational level			
< High school graduate	reference		
High school graduate or GED	0.84	0.74-0.95	0.01
Some college	0.84	0.71-1.00	0.06
≥ Vocational school or Associate's degree	0.90	0.76-1.07	0.25
Model $p>\chi^2$			<0.001

Note: Models adjust for clustering by site using robust variance estimators.

Table 5.4: Hazard ratios for rate of receipt of ESS services for families enrolling in HFNJ in 2014-2015, by TANF participation

	TANF					
	Participants			Non-participants		
Predictor	**HR**	**95% CI**	***p***	**HR**	**95% CI**	***p***
Primarily non-English speaking	0.76	0.52-1.135	0.18	0.80	0.69-0.93	<0.001
Poor maternal mental health	0.96	0.78-1.17	0.68	1.00	0.87-1.16	0.93
Maternal age						
<18	reference					
18-24	1.10	0.46-2.60	0.83	0.98	0.73-1.32	0.90
25-34	1.10	0.47-1.61	0.83	0.94	0.69-1.27	0.68
≥35	1.04	0.47-2.65	0.94	0.88	0.62-1.23	0.44
Prenatal entry to program	0.90	0.73-1.11	0.33	0.80	0.70-0.91	<0.001
Family Survey score	1.01	1.00-1.01	0.14	1.00	1.00-1.01	0.11
Current maternal employment	1.03	0.71-1.51	0.87	0.99	0.84-1.15	0.85
Parity						
0	reference					
1	0.92	0.44-1.89	0.83	0.96	0.80-1.13	0.56
≥2	0.80	0.39-1.64	0.55	0.97	0.79-1.15	0.64
Married	0.93	0.59-1.45	0.74	1.21	1.02-1.43	0.03
Educational level						
< High school graduate	reference					
High school graduate or GED	0.83	0.67-1.03	0.09	0.85	0.72-0.99	0.04
Some college	0.78	0.58-1.05	0.11	0.85	0.70-1.05	0.13
≥ Vocational school or Associate's degree	0.86	0.61-1.21	0.40	0.91	0.75-1.12	0.38
Model $p>\chi^2$			0.54			<0.001

Note: Models adjust for clustering by site using robust variance estimators.

Chapter 6: Association of TANF Participation and Receipt of Economic Self-Sufficiency Services with Duration of Enrollment in Home Visiting

Chapter 6: Association of Temporary Assistance for Needy Families Participation and Receipt of Economic Self-Sufficiency Services with Duration of Enrollment in Home Visiting

Abstract

Objectives: Many families and young children enrolled in home visiting (HV) experience health and social benefits, but HV programs often have difficulty retaining families in services. The goal of this study was to investigate the association of participation in the Temporary Assistance for Needy Families (TANF) program and receipt of economic self-sufficiency (ESS) services with duration of enrollment in HV.

Methods: A retrospective cohort study assessed duration of enrollment up to one year for expectant women and mothers with a child under three years old who enrolled in Healthy Families New Jersey in 2014-2015. Survival analyses compared retention in the first year for families who received versus did not receive ESS services in the first three months of enrollment. Models were clustered by site, adjusted for family characteristics at enrollment, and stratified by TANF participation.

Results: Among the 2,411 enrolled families who could choose to leave services, 745 (30.9%) participated in TANF and 643 (26.7%) received ESS services in the first three months after enrollment. A higher proportion of TANF participants received ESS services than TANF non-participants (29.3% vs. 25.5% receiving, $p=0.05$). On average, TANF participants received ESS services earlier in enrollment (46.3 vs. 61.1 days after enrollment, $p<0.001$). A lower percentage of TANF participants were enrolled in HV at one year after enrollment (30.5 vs. 48.0%, $p<0.001$). TANF participants, on average,

enrolled in HV for nearly 50 fewer days than non-participants (186.3 vs. 235.2 days, $p<0.001$). Families who received ESS services remained enrolled in HV for nearly three weeks longer than those who did not receive ESS services (235.8 vs. 214.4 days, $p<0.001$). However, ESS service receipt did not differentially influence duration of enrollment based on TANF participation ($p=0.63$).

Conclusions: Few families received ESS services in the first three months after enrolling in HV. Many families enrolled in HV also participated in TANF, but the rate of ESS service receipt did not differ between TANF participants and non-participants. Few families remained enrolled in HV for a full year, and TANF participants enrolled in HV for shorter durations than TANF non-participants. When families received services related to ESS, they remained enrolled in HV for longer durations. However, the effect associated with ESS services was not greater for TANF participants. Both TANF participants and non-participants may benefit from the receipt of ESS services early in enrollment.

Introduction

Many children in the United States are born into circumstances that compromise their health, education, and welfare. Home visiting (HV) can improve a wide array of health and social outcomes for young children and their families.[2–5] HV programs aim to improve family circumstances through direct services and referrals to other community resources for expectant families and families with young children. In home visits, home visitors are paired with families to engage in shared goal-setting and curriculum-based activities that support family asset-building. Services provided to families in HV typically include health screenings, parent support and coaching, goal-setting, curriculum-based activities, and referring or linking families to community health and social resources.

In 2016, 160,000 parents and children were served by HV programs in the U.S.[1] HV in the United States usually serves families experiencing behavioral, health, parenting, or social adversity.[46] Families who participate in HV often live in challenging circumstances that include limited economic self-sufficiency (ESS), characterized by low educational attainment, poverty, and unemployment. Of families who were eligible for HV in 2015, 13% had not completed high school, more than one-quarter of families lived below the federal poverty threshold, and approximately 30% had no parent who was employed full-time.[84] Families who participated in the Mother and Infant Home Visiting Program Evaluation (MIHOPE), a large-scale randomized controlled trial that includes 4,450 families across twelve states, exhibited the following ESS risks: three-quarters of families had attained a high school diploma or less; more than one-fifth of families in HV had not been employed in the prior three years; more than 90% of families were supported by some public assistance; and more than one-fifth of families participated in TANF.[88]

Research into HV has found significant benefits for young children with regard to child abuse prevention, language and cognition, and prevention of myriad health and behavioral problems.[2–5,12] Families at enrollment in HV differ in their parenting risks, assets, goals, and expectations of programs, so services are expected to exhibit some variation. Home visitors are encouraged to varying degrees by their local leadership and national models to align services with family characteristics,[22,27,119,125] but this approach can be challenging if a family's needs extend beyond a program's intended reach or if the program prioritizes outcomes that are different from those of families.

Service tailoring occurs when services, defined as visit content and referrals to community resources, align with family assets and risks. Services are tailored through purposeful variation in a program's intended model and services as they are adapted to family characteristics through ongoing shared decision making and agenda setting.[13,16,18–21,23,117,118] Home visiting research typically focuses on aggregate family outcomes and services delivered and does not investigate tailoring of services to address specific family characteristics.[27–30] Evaluations of HV report variability in sites' delivery of program content and referrals.[24,74,112,126] A review of 20 randomized trials of home visiting programs reported that only 40% provided any description of services provided to families.[83] However, evidence suggests that satisfaction with services increases as content becomes more individualized, and this may then promote continued enrollment and greater improvements in outcomes.[17,22–26,35–37]

Between 27%-50% of families who enroll in evidence-based HV programs do not complete the first year as recommended, with up to one-third discontinuing enrollment within the first month.[8,14,16,28,37,40,75,78,89–91] Families may choose to leave services voluntarily, or programs may decide to disenroll families. Families report leaving HV because they are not interested in program content, do not perceive the program to be beneficial, are uncomfortable with the home visitor, do not feel comfortable opening their home to the home visitor, are too busy to engage, or experience household or family upheaval that makes participation difficult.[13,17,93–97] Programs may choose to terminate services to a family if a family moves from the program target area or the program determines that it cannot meet a family's needs. HV can improve a wide array of health, cognitive, behavioral, and social outcomes for young children and their families, but effectiveness may be diminished when families do not receive the full set of recommended services.[3,11,42,81,83]

Participation in the Temporary Assistance for Needy Families (TANF) program is one marker of elevated family ESS risk. Prior research investigating the association between family risk factors and duration of enrollment in HV has found mixed results. Higher levels of risk factors overall have been associated both with longer[90,98–103,112] and shorter[101,104–106] durations of enrollment in HV. HV programs report difficulties in retaining families in services if they enter work, training programs, or school or disenroll from TANF.[61] TANF participation has not been empirically linked to duration of enrollment in HV, though increased economic risk specifically has been associated with a shorter duration of enrollment in HV.[16,26,92,139] Families who struggle to find employment may remain enrolled in HV programs for a shorter duration.[16]

Whether and how services might be tailored to improve outcomes for families requires a greater understanding of what services are actually provided to families early in enrollment, how ESS services align with family characteristics such as ESS risks, and how receipt of ESS services specifically may influence duration of family enrollment. The goal of this study was to investigate the association of early receipt of ESS services with subsequent duration of enrollment in HV, and to determine whether this association differs for TANF participants and non-participants.

Setting

TANF in New Jersey: New Jersey provides child development and family support services through a network of interconnected programs. TANF provides cash transfers directly to families in exchange for participation in activities that promote ESS. Families are eligible for TANF if they meet specific requirements that include: 1) exhibiting urgent education, employment, or financial needs; 2) parenting a child under the age of 18; and 3) possessing U.S. citizenship or at least five years of uninterrupted legal resident status.[68,69] TANF participants are required to achieve educational and employment goals established by the State of New Jersey's employment readiness standards through participation in education, employment, financial, and other supportive services.[67,69,144,145]

HV in New Jersey: New Jersey has a system of voluntary home visiting programs that enrolls nearly 5,000 families annually. Families who participate in HV in New Jersey display diverse needs and risk factors. In 2015, one-third of parents served by HV in New Jersey had not attained a high school diploma and nearly one-fifth of parents in the state lived below the federal

poverty level.[84] New Jersey is required to show improvements in ESS and other outcomes for families served by HV programs that receive funding from the federal Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program.[38,146]

The Healthy Families-TANF Initiative for Parents: Healthy Families America is one of three programs operating statewide in New Jersey and is the largest HV provider in the state.[57–59] In 2005, the New Jersey Department of Human Services partnered with Healthy Families America in New Jersey to create the Healthy Families-TANF Initiative for Parents with the goal of strengthening and supporting families who participate in both HV and TANF.[57,64,67] Through this initiative, the TANF program partially funds HV with the caveat that HV programs must provide ESS services to mothers who participate in TANF.[62,66,68,147] Families who are enrolled in both HV and TANF can use their HV participation to meet some or all of the TANF mandated employment-directed activity requirements until a child reaches one year of age.[67,69]

The goal of this study was to better understand the association of family economic risk and receipt of ESS services with duration of enrollment in HV. The study assessed whether receipt of ESS services was associated with a longer duration of enrollment in HV for TANF participants versus non-participants. Whether and how HV service delivery and retention efforts can be improved requires a greater understanding of interplay between family characteristics at enrollment, receipt of ESS services, and duration of enrollment. These findings may inform the design of interventions to improve HV service delivery and retention efforts for newly enrolling families.

Methods

Study design

A retrospective cohort study assessed duration of enrollment up to one year for expectant women and mothers with a child under three years old who enrolled in Healthy Families New Jersey in 2014-2015. The study tested the association of receipt of services tailored to ESS with duration of enrollment in HV for TANF participant and non-participant families.

Participants

Families were eligible for inclusion in the study if they enrolled in HFNJ between January 2014 and December 2015 and received at least one home visit. Families were comprised of an expectant woman or mother living in New Jersey with a child under three years of age. Families were screened by the HV program to determine family needs and characteristics.[70] Families were offered HV services if they were determined by the program to be at risk for adverse social, economic, or health outcomes.

Families were excluded from the study if they unintentionally discontinued their enrollment in HV. Reasons for non-intentional attrition included miscarriage, maternal or infant death, transfer to another program, moving out of the program catchment area, or a lack of resources at the program to serve the family. Reasons for intentional attrition included refusing services, inability to contact, or lack of time due to enrolling in educational programs or entering employment.

Data source

Study data were drawn from the Healthy Families New Jersey statewide administrative data system from 2014 to 2016. The data were collected during the first year of family enrollment in HV and included information about 1) family social, economic, and demographic characteristics at enrollment; 2) home visit content and referrals; and 3) dates of home visits received by families.

Measures

Independent variables

TANF participation: A dichotomous variable was created to indicate whether a family participated in TANF at intake or within one month of enrollment in HFNJ.

Receipt of ESS services

Families were determined to have received ESS services if, in the course of at least one home visit, the home visitor performed one or more of the following behaviors related to:

ESS content: 1) Provided information on educational and training options; 2) Discussed employment and training; 3) Provided employment information and/or helped parent(s) look for job; 4) Discussed household income and/or financial literacy; or 5) Provided information and/or assistance on ESS.

ESS referrals: Provided at least one referral to: 1) adult basic education, GED preparation, special education, college, or other educational services; 2) job readiness and/or employability skills, job search and placement assistance, work experience, One-Stop Career Center, or vocational or job skills training; or 3) money management service.

ESS services in the first three months after enrollment: A dichotomous variable was created to indicate whether a family received ESS services within three months of enrollment.

Time to receipt of ESS services: A continuous variable was created to count the number of days from enrollment to the first instance of receipt of ESS services. Families who did not receive ESS services in the first year of enrollment were censored at 365 days.

Dependent variable

Duration of enrollment: Duration of enrollment was measured as the number of days from enrollment to the final home visit. For families who remained enrolled for the entire study period, the duration of enrollment was censored at 365 days.

The date of discharge from HV reported by the program is not necessarily the same as the date of the final home visit. Some families are disengaged from services but remain enrolled in HV while programs conducted creative outreach efforts to re-engage them.[140] Duration of enrollment may appear shorter in this study than other studies that used formal program enrollment data.[8,9,83,140]

Covariates

Variables were included as covariates in adjusted models if they: 1) had been included as a covariate in at least one randomized controlled trial of Healthy Families America determined to be of 'high quality' by the Home Visiting Evidence of Effectiveness; [131,132] 2) were available in

the administrative data; 3) were significantly associated with at least one independent variable in bivariate analyses ($p<0.10$); 4) were not collinear with other variables (significance level of $R^2>0.40$ and $p<0.05$); and 5) were not missing in more than 10% of the sample.

Maternal demographic characteristics that met these criteria were: age at enrollment in HV, highest educational attainment, marital status, parity, primary language, poor maternal mental health, employment status, prenatal entry into HV, and maternal score on the Family Survey.

Preparation of covariates: All covariates were present in administrative data. Age at enrollment in HV was calculated by subtracting the maternal birthdate from the date of enrollment and rounding to the last completed birthday. Maternal age was included as a categorical variable: <18, 18-24, 25-34, ≥35 years. Family educational attainment was recorded as not completed high school, graduated high school, attended some college, or completed advanced training. Advanced training was comprised of vocational training, Associate's or Bachelor's degrees, or a graduate degree. Marital status was dichotomized as married or unmarried. An ordinal variable for parity was created to indicate whether families had zero children, one child, or more than one child. Families were considered to be primarily non-English speaking if they primarily spoke Spanish or a language other than English. A dichotomous variable for poor maternal mental health was created to indicate whether a mother was identified at assessment or enrollment to HV as having a) a history of depression or other mental illness, b) current depression, or c) current mental health service involvement. The child's birthdate or estimated date of delivery was compared with the date of enrollment in HV to designate whether families entered HV prenatally or postnatally. Overall family risk was determined by Family Survey score. The

Family Survey is conducted before enrollment to HFNJ and is used to calculate an overall family risk score based on the assessment of a wide array of stressors. The risk factors assessed on the Family Survey include factors associated with increased risks of adverse health and social outcomes for children such as teen or first-time pregnancy, household poverty, inadequate prenatal care, unstable housing, social isolation, poor mental health, substance use, intimate partner violence, and previous reports of child abuse or neglect.[64,133] The Family Survey score increases in five unit increments as families are determined to be at low, medium, or high risk for each factor. Families who exhibit no risks receive a zero on the Family Survey. Families who score between 25 and 45 on the Family Survey are offered services to HFNJ. Families who score lower or higher may be offered enrollment at the discretion of the HFNJ site.[64]

Covariates ranged from 0%-6.9% missing values. Data were complete for 87.2% of the total sample. Only 3.0% of families were missing two or more covariates. Mean and mode imputation were performed to estimate values for missing data.[136]

Analyses

Univariate and bivariate descriptive statistics were calculated using proportions, means, standard deviations, Student's *t* tests, and chi-square statistics. Independent variables and covariates were tested for multicollinearity using Spearman's pairwise correlations. Total time at risk, incidence rates of attrition, and unadjusted Kaplan-Meier estimates of survival time were calculated for the total sample and for families who received ESS services. Hazard rates were constructed to calculate the probability of attrition at a given time assuming that a family remained enrolled until that time. The hazard rates of ESS recipients and non-recipients were used to calculate

hazard ratios (HRs). Unadjusted hazard ratios reported the relative risk of attrition for families who received ESS services within three months after enrollment vs. families who did not receive ESS services within three months after enrollment. Unadjusted hazard ratios were then adjusted for covariates and clustered by site. Survival curves were plotted by TANF participation and receipt of ESS services and equivalencies were compared using log-rank tests.[141,142] Student's *t* tests were conducted to test for whether observed increases in duration of enrollment differed between TANF participants and non-participants who received ESS services. The proportional hazards assumption was checked for each model using plots, proportional hazards tests, and log-rank tests.

The Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health deemed this secondary data analysis to be not human subjects research.

Results

Of the original sample, 368 families were excluded due to transfer to another program or moving out of the program catchment area (n=309), miscarriage or maternal or infant death (n=47), or program lack of resources to serve (n=12). The final analytic sample included 2,411 families.

Characteristics of the sample

Among families in the sample, 745 (30.9%) participated in TANF. Demographic and social characteristics of families varied by TANF participation (see Table 6.1). A smaller proportion of TANF participants were under 18 years old or 35 years or older when compared with non-

participants ($p \leq 0.001$). A smaller proportion of TANF participants enrolled prenatally when compared with TANF non-participants (24.8% vs. 57.7%, $p<0.001$). English was the primary language spoken by 91.3% of TANF participants, while only 54.2% of non-TANF participants spoke primarily English ($p<0.001$).

Receipt of ESS services

Over one-quarter (26.7%) of families in the sample received ESS services in the first three months of enrollment (see Table 6.2). A greater percentage of TANF participants received ESS services in the first three months of enrollment than TANF non-participants (29.3% vs. 25.5%, $p=0.05$). Families who received ESS services were enrolled an average of 56.4 days before receipt. TANF participants received ESS services sooner on average than non-TANF participants (46.3 vs. 61.1 days, $p<0.001$).

Duration of enrollment

By TANF participation: At one year after enrollment, 30.5% of TANF participants and 48.0% of non-TANF participants remained enrolled in HV ($p<0.001$; see Table 6.3). TANF participants were enrolled on average for seven fewer weeks than non-TANF participants (186.3 days vs. 235.2 days, $p<0.001$). In unadjusted models, TANF participation was associated with a 59% increase in the risk of attrition in HV (HR 1.59, $p<0.001$; see Table 6.4 Model 1).

By ESS service receipt: At one year after enrollment, 47.4% of families who received ESS services in the first three months and 40.5% of families who did not receive ESS services in the first three months remained enrolled in HV ($p=0.003$). Families who received ESS services in

the first three months were enrolled on average for three weeks longer on average than families who did not receive ESS services in the first three months (235.8 days for ESS recipients vs. 214.4 for ESS non-recipients, $p<0.001$). In unadjusted models, ESS service receipt in the first three months was associated with an 18% decrease in the risk of attrition (HR 0.82, $p=0.002$; see Table 6.4 Model 2).

Figure 6.1.A depicts the probability of retention in HV for families who received and did not receive ESS services in the first three months of enrollment after adjusting for covariates and clustering by site. Families who received ESS services in the first three months after enrollment had a higher probability of retention in HV at every point in the first year.

Cox proportional hazards models were adjusted for covariates and clustered by site. TANF participation was not associated with duration of enrollment in HV after adjusting for covariates ($p=0.70$; see Table 6.4 Model 3). Receipt of ESS services in the first three months of enrollment was associated with a 21% decreased risk of attrition (HR 0.79, $p<0.001$). Covariates associated with decreased risks of attrition included entering HV prenatally (17% decrease, HR 0.83, $p=0.002$) and primarily speaking a language other than English (39% decrease, HR 0.61, $p<0.001$) when holding other variables constant.

Risk of attrition, by TANF participation

TANF participants: Over one-third (35.8%) of TANF participants who received ESS services in the first three months remained enrolled for one year, but only 28.3% of TANF participants who did not receive ESS services in the first three months remained enrolled for one year ($p<0.001$;

see Table 6.5). On average, TANF participants who received ESS services in the first three months were enrolled for 28 days more than TANF participants who did not receive ESS services in the first three months (206.1 days vs. 178.1 days, p=0.02). Receiving ESS services in the first three months of enrollment was associated with a 20% decrease in the risk of attrition for TANF participants in the unadjusted model (HR=0.80, p=0.03; see Table 6.6). After adjusting for covariates, receiving ESS services in the first three months of enrollment was associated with a 20% decrease in the risk of attrition for TANF participants (HR=0.80, p=0.03). Other characteristics associated with decreases in the risk of attrition for TANF participants included poor maternal mental health (18% decrease, p=0.05), older maternal age as compared with participants under age 18, and entering HV prenatally (38% decrease, p<0.001) when holding other variables constant.

TANF non-participants: Over half (53.4%) of TANF non-participants who received ESS services in the first three months remained enrolled for one year, but only 46.1% of TANF non-participants who did not receive ESS services in the first three months remained enrolled for one year (p<0.001). On average, TANF non-participants who received ESS services in the first three months were enrolled for 21.2 days longer than TANF non-participants who did not receive ESS services in the first three months (251.0 days vs. 229.8, p<0.001). Receiving ESS services in the first three months of enrollment was associated with a 20% decrease in the risk of attrition for TANF non-participants in the unadjusted model (HR=0.80, p=0.01). After adjusting for covariates, receiving ESS services in the first three months was associated with a 23% decrease in the risk of attrition for TANF non-participants (HR=0.77, p<0.001). Other characteristics associated with decreases in the risk of attrition for TANF non-participants included exhibiting

maternal age older than 35 years (35% decrease, $p=0.02$) and primarily speaking a language other than English (42% decrease, $p<0.001$) when holding other variables constant.

Comparing TANF participants and non-participants:

Figure 6.1.B depicts the probability of retention in HV by TANF participation and receipt of ESS services in the first three months after adjusting for covariates and clustering by site. Receipt of ESS services is denoted using solid lines for recipients and dashed lines for non-recipients. Receipt of ESS services in the first three months of enrollment was associated with increases in the probability of retention in HV when stratifying by TANF participants (in black) and TANF non-participants (in gray). TANF participants who receive ESS services in the first three months of enrollment initially have high rates of continued enrollment, but around one month post-enrollment their risk of attrition increases steeply and dips below that of TANF non-participants who do not receive ESS content.

ESS service receipt in the first three months was associated with an average increase in duration of enrollment of 24.4 days in TANF participants. TANF non-participants showed increases in their duration of enrollment of 21.2 days. Receipt of ESS services in the first three months was associated with increased probabilities of retention in HV among TANF participants and TANF non-participants alike. However, ESS service receipt in the first three months did not differentially influence duration of enrollment based on TANF participation ($p=0.63$). That is, the receipt of ESS services in the first three months was not associated with additional gains in duration of enrollment for TANF participants when compared with TANF non-participants.

Discussion

The goal of this study was to investigate the association of receipt of ESS services in the first three months with duration of enrollment in HV among TANF participants and non-participants.

Many families enrolled in HV also participate in TANF. TANF participants were expected to receive ESS services soon after enrollment because of the strong partnership between HV and TANF in New Jersey focused specifically on improving family ESS.[147] However, approximately one-quarter of families overall received ESS services in the first three months, and less than one-third of TANF participants received ESS services in the first three months.

Families in this study were expected to remain enrolled for the entire one-year follow-up period, but this study found that only two-fifths of families remained enrolled for one year. The study hypothesized that TANF participants in particular would remain enrolled in HV for shorter durations because they have more stressors overall,[101,104–106] especially employment[16] or economic risks[16,26,92,139] previously associated with shorter durations of enrollment in HV. However, TANF participants were found to be at no increased risk of attrition after adjusting for covariates and clustering by site.

This study found rates of attrition comparable to that of other studies of Healthy Families America. Healthy Families New Jersey (HFNJ) expects families to remain for three years, and longer durations of enrollment have been associated with greater improvements in outcomes for families enrolled in HV.[6–12] Ammerman et al. followed 515 first-time mothers in Healthy Families America (HFA) programs and found that 32% of families dropped out of the program

before completion of their first month.[90] Other studies of HFA found rates of attrition of roughly 50% in the first year of the child's life.[18,40,78]

This study hypothesized that receipt of ESS services in the first three months after enrollment in HV would be associated with a longer duration of enrollment for families who participated in TANF, but not for families who did not participate in TANF. When services are tailored to address family characteristics and needs, families may feel more satisfied or engaged in services. Other studies have found that satisfaction with services increases as content becomes more tailored to individual family characteristics, and that that this relationship influences the duration of family enrollment.[35–37]

In this study, receipt of ESS services in the first three months was associated with over three weeks of additional enrollment in HV. Both TANF participants and non-participants remained enrolled in services longer if they received ESS services soon after enrollment, but the improvements in retention associated with receipt of ESS services were not greater for TANF participants.

This study found that TANF participants 1) exhibited no increased risk of attrition; 2) received no increased rates of ESS services; and 3) achieved no greater increases in duration of enrollment associated with receipt of ESS services when compared to TANF non participants. This study used TANF participation as a marker for urgent education, employment, and financial needs. However, participation in TANF may be only one of many markers that indicate severe family ESS risk. Previous studies have found that most families enrolling in HV exhibit

heightened economic risks.[7,28,37,40–42,74–83,88] The confluence of low educational attainment, employment challenges, and poverty may manifest in many ways beyond family participation in TANF. TANF participation may not be an adequate indicator to identify and differentiate families with severe ESS risks.

Alternatively, TANF participation may identify families who initially had higher ESS risks, but are no longer at high risk due to support by social service programs. TANF participants may not in fact be at higher ESS risk in the first year after enrollment to HV when compared to TANF non-participants. Family economic needs may be partially, though temporarily, met when families receive cash transfers through TANF. Families with ESS risks who do not participate in TANF may continue to struggle with unmet ESS needs. Families may receive ESS services through TANF, so they may not need or want this type of service to be provided by HV. This study only examined ESS service receipt in the first three months of enrollment, but families may have greater motivation to pursue ESS goals if their two-year limit on TANF support nears or if they approach their five year lifetime cap on TANF receipt.

The study highlights an opportunity for HV and TANF to strengthen the alignment of their services to help families achieve ESS goals. This study found that few families received ESS services, and that receipt of ESS services was associated with over three weeks additional enrollment for families. TANF participants were no more likely to receive ESS services than non-participants, but both groups showed an additional three weeks of enrollment associated with receiving ESS services. HV programs may want to deliver ESS services to all families soon after their enrollment in HV to maximize retention. Both HV and TANF focus on improving

ESS outcomes specifically for families determined to be at heightened ESS risk. When HV programs identify subgroups of families at heightened ESS risk or at increased risk for attrition, HV programs may want to target these families with ESS services.

Strengths and limitations

This study should be interpreted in context of its strengths and limitations. This study was undertaken to address the challenge of family retention articulated by HV programs themselves.[59] The study focused on two programs working in partnership to achieve well-aligned goals to improve family ESS. This study adds to the evidence base that investigates service delivery and duration of family enrollment in home visiting specifically and social services more generally. Administrative services, demographic characteristics, TANF participation, and duration of enrollment in the program are likely to be accurately ascertained and recorded in the HV program due to the existence of sophisticated, standardized, statewide management information system with continuous quality improvement initiatives for service delivery and data.

Several limitations are noted. Dosage of ESS services received, such as the proportion of visits that included ESS services, was not included in this study. Some unobserved measures, such as the availability of referral resources in a community or site-specific home visitor training, may have influenced the delivery of services to families. Some unobserved measures, such as residential mobility, may have improved the prediction of attrition. However, clustering by site may have reduced some of these effects. Family or household income or wealth measures were not available in the data, nor were measures of current enrollment in educational programs.

Some covariates were based on mothers' self-report to the home visitor. However, the proportion of families with ESS risk factors in the study is similar to other studies that estimate prevalence at enrollment, indicating adequate ascertainment.[143] The measure of primary language was based on mothers' self-report to the home visitor, but English proficiency levels were not measured. Qualitative data about families' self-identified needs, inclusion in selecting visit activities, and satisfaction with services may enhance future studies that investigate HV service delivery. Future studies of HV enrollment continuation could be enhanced by including qualitative data regarding family perception of needs, how families respond to the alignment of HV services with these needs, and reasons for discontinuing enrollment in HV.

Conclusion

HV serves families with diverse characteristics who live with social, economic, biologic, and behavioral health adversity. Family ESS is a high priority outcome for both HV and TANF, and both programs are required to show ESS improvements among their enrollees.[38,146] However, few families received ESS services in the first three months after enrollment. HV programs recommend that families remain enrolled for several years, but retention in programs is a challenge. This study was undertaken to better understand how tailoring services to ESS risks early in enrollment in HV may influence retention in HV. The findings of this study may be used to strengthen the alignment of HV and TANF priorities to help families achieve ESS goals.

All families enrolling in HV may experience challenges related to education, employment, and finance, regardless of their participation in TANF. This study found that families who received

services related to ESS remained enrolled in services longer than families who do not receive ESS services. Understanding the relationship between family ESS risks, TANF participation, and duration of enrollment is crucial to improve outreach, retention efforts, and outcomes for families in HV services. The findings of this study may inform retention efforts that focus on improving services delivered to families enrolled in HFNJ as well as home visiting nationwide. HV programs have an opportunity to increase family duration of enrollment by delivering ESS services to families soon after they enroll in HV.

Table 6.1: Characteristics of families enrolling in HFNJ in 2014-2015 at risk for intentional attrition, by TANF participation

Characteristic	All *n* = 2,411	TANF Participant *n* = 745	TANF Non-participant *n* = 1,666	*p*
Maternal age (years), %				
<18	4.2	1.3	5.5	<0.001
18-24	36.5	45.9	32.2	
25-34	47.1	46.2	47.5	
≥35	12.2	6.6	14.8	
Enrolled prenatally, %	47.5	24.8	57.7	<0.001
Parity, %				
0	16.0	2.0	22.2	<0.001
1	38.1	40.4	37.1	
≥ 2	45.9	57.6	40.7	
Marital status, % Unmarried	84.4	94.1	80.1	<0.001
Education, %				
< High school graduate	38.0	31.0	41.2	<0.001
High school or GED	33.6	42.3	30.0	
Some college	15.4	16.4	15.0	
≥ Vocational school or Associate's degree	13.0	10.3	14.2	
Mother employed, %	18.0	6.7	23.1	<0.001
Race/ethnicity, %				
Non-Hispanic, white	15.3	18.1	14.2	0.11
Non-Hispanic, black	30.6	31.3	30.3	
Hispanic/Latina	46.6	43.8	47.8	
Other/multiracial	7.5	6.9	7.7	
Primary language, %				
English	65.7	91.3	54.2	<0.001
Non-English	34.3	8.7	45.8	
Family Survey score, mean (SD)	30.9	35.3	28.9	<0.001
Poor maternal mental health, %	38.2	43.6	35.8	<0.001

Table 6.2: Economic self-sufficiency service receipt in the first three months and first year for families enrolling in HFNJ in 2014-2015, by TANF participation

	Received ESS services in the first three months %	*p*	Days to first receipt mean	*p*
All families (n=2,411)	26.7		56.4	
TANF participants (n=745)	29.3	0.05	46.3	<0.001
TANF non-participants (n=1,666)	25.5		61.1	

Table 6.3: Duration of enrollment in the first year for families enrolling in HFNJ in 2014-2015, by TANF participation or receipt of ESS services

	Duration of Enrollment				
	% enrolled ≥ 1 year	***p***	**Mean (days)**	**SD**	***p***
All families	42.6		220.1	145.3	
By TANF participation					
Participants (n=745)	30.5	≤0.001	186.3	143.3	<0.001
Non-participants (n=1,666)	48.0		235.2	143.7	
By receipt of ESS services					
Received ESS services (n=643)	47.4	0.003	235.8	140.8	<0.001
Did not receive ESS services (n=1,768)	40.8		214.4	146.6	

Table 6.4: Hazard ratios for risk of attrition in the first year of enrollment for families enrolling in HFNJ in 2014-2015

Model		HR	95% CI	*p*
	Unadjusted			
1	TANF participation	1.59	1.4-1.8	<0.001
2	Received ESS services in first three months	0.82	0.7-0.9	0.002
	Adjusted			
3	TANF participation	1.10	0.69-1.75	0.70
	Received ESS services in first three months	0.79	0.70-0.90	<0.001
	Poor maternal mental health	0.92	0.82-1.03	0.15
	Maternal age			
	<18	reference		
	18-24	0.92	0.58-1.44	0.71
	25-34	0.68	0.34-1.37	0.29
	≥35	0.46	0.17-1.29	0.14
	Prenatal entry to program	0.83	0.73-0.93	0.002
	Family Survey score	1.00	0.99-1.00	0.61
	Current maternal employment	1.08	0.92-1.25	0.34
	Primarily non-English speaking	0.61	0.53-0.71	<0.001
	Parity			
	0	reference		
	1	0.96	0.80-1.14	0.62
	≥2	1.04	0.87-1.26	0.65
	Married	0.89	0.75-1.05	0.17
	Educational level			
	< High school graduate	reference		
	High school graduate or GED	0.96	0.84-1.10	0.53
	Some college	0.99	0.83-1.17	0.87
	≥ Vocational school or Associate's degree	0.84	0.70-1.03	0.09

Note: Model 3: $\chi^2 = 141.5$, $p<0.001$

Note: Models investigate attrition. HRs below 1.0 indicate a decreased risk of attrition.
Note: Models adjust for clustering by site using robust variance estimators.

Table 6.5: Duration of enrollment in the first year for families enrolling in HFNJ in 2014-2015, by TANF participation and receipt of ESS services

	Duration of Enrollment				
	% enrolled ≥ 1 year	*p*	Mean (days)	SD	*p*
All families	42.6		220.1	145.3	
By TANF participation and ESS service receipt					
TANF participants					
Received ESS services (n=218)	35.8	<0.001	206.1	141.7	0.02
Did not receive ESS services (n=527)	28.3		178.1	143.3	
TANF non-participants					
Received ESS services (n=425)	53.4	<0.001	251.0	138.1	<0.001
Did not receive ESS services (n=1,241)	46.1		229.8	145.3	

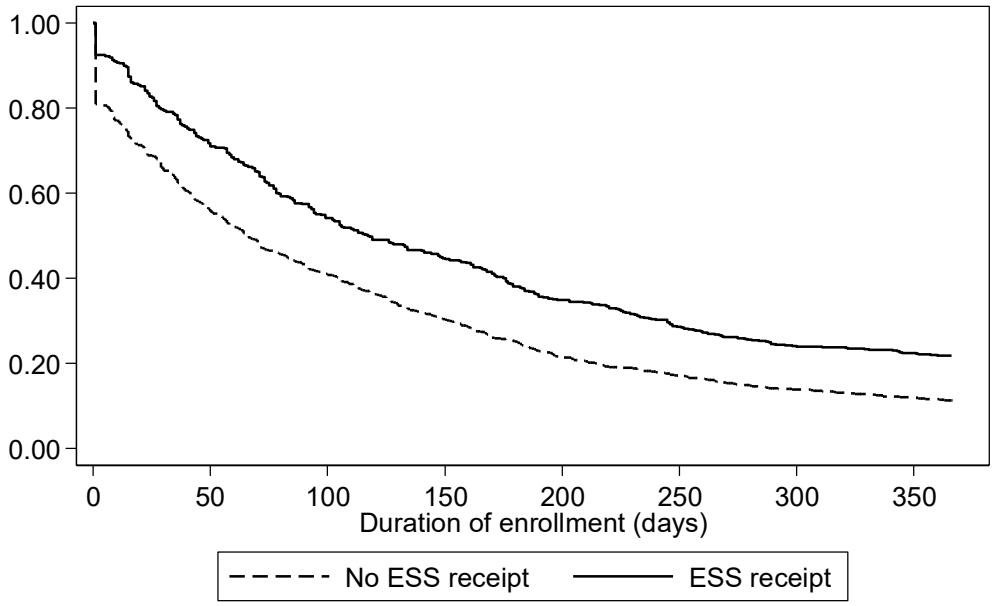
Table 6.6: Hazard ratios for risk of attrition for families enrolling in HFNJ in 2014-2015, by TANF participation

	TANF participants			TANF non-participants		
	HR	**95% CI**	***p***	**HR**	**95% CI**	***p***
Unadjusted						
Received ESS services in first three months	0.80	0.67-0.97	0.03	0.80	0.69-0.94	0.01
Adjusted						
Received ESS services in first three months	0.80	0.66-0.99	0.03	0.77	0.65-0.90	<0.001
Poor maternal mental health	0.82	0.68-1.00	0.05	0.94	0.82-1.10	0.49
Maternal age						
<18	reference					
18-24	0.58	0.32-1.04	0.07	1.09	0.81-1.47	0.57
25-34	0.46	0.25-0.84	0.01	0.86	0.63-1.18	0.36
≥35	0.32	0.16-0.65	0.002	0.65	0.45-0.93	0.02
Prenatal entry to program	0.62	0.48-0.81	<0.001	0.89	0.77-1.03	0.12
Family Survey score	1.00	0.99-1.01	0.84	1.00	0.99-1.00	0.42
Current maternal employment	0.74	0.47-1.15	0.18	1.12	0.95-1.31	0.18
Primarily non-English speaking	0.84	0.60-1.18	0.32	0.58	0.49-0.69	<0.001
Parity						
0	reference					
1	0.82	0.41-1.65	0.58	1.00	0.82-1.21	0.98
≥2	0.90	0.45-1.81	0.77	1.08	0.88-1.33	0.44
Married	1.07	0.71-1.67	0.75	0.86	0.71-1.04	0.12
Educational level						
< High school graduate	reference					
High school graduate or GED	0.98	0.79-1.22	0.87	0.95	0.79-1.13	0.53
Some college	0.99	0.76-1.30	0.96	1.00	0.80-1.24	0.98
≥ Vocational school or Associate's degree	0.87	0.61-1.22	0.41	0.84	0.67-1.06	0.14
Model $p>\chi^2$			<0.001			<0.001

Note: Models investigate attrition. HRs below 1.0 indicate a decreased risk of attrition.
Note: Models adjust for clustering by site using robust variance estimators.

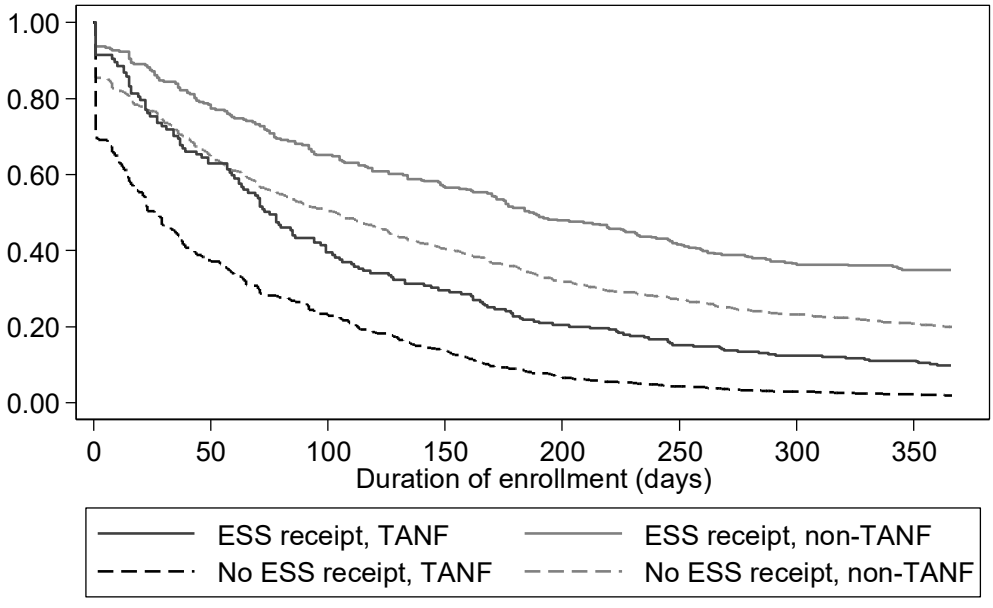
Figure 6.1: Probability of retention in the first year for families enrolling in HFNJ in 2014-2015 A) by receipt of ESS services in first three months of enrollment and B) by TANF participation and receipt of ESS services in first three months of enrollment

Figure 6.1.A: Probability of retention in home visiting, by receipt of ESS services in first three months of enrollment



p=0.002

Figure 6.1.B: Probability of retention in home visiting, by TANF participation and receipt of ESS services in first three months of enrollment



p=0.63

Adjusted for maternal age, poor mental health, employment, education, marital status, primary language, parity, prenatal entry, Family Survey score, and site. Figure 6.1.A also adjusted for TANF participation.

Chapter 7: Conclusion

Chapter 7: Conclusion

The goal of this study was to investigate the association of participation in the Temporary Assistance for Needy Families (TANF) program and receipt of economic self-sufficiency (ESS) services with duration of enrollment in home visiting (HV).

Summary of Results

This study found that:

1. Few families received ESS services in the first three months after enrollment, and only half of families received ESS services in the first year.
2. Participation in TANF was not associated with rates of receipt of ESS services.
3. Few families remained enrolled in HV for one year or longer.
4. Participation in TANF was not associated with the duration of enrollment in HV services.
5. Receipt of ESS services in the first three months of enrollment was associated with a three week increase in duration of enrollment in HV.
6. Increases in duration of enrollment associated with ESS service receipt did not differ between TANF participants and non-participants.
7. The effect of primary language varied by TANF participation for both ESS service receipt and duration of enrollment in HV.

The goal of Aim 1 was to assess the association of maternal characteristics with duration of enrollment for newly enrolled families in HV. The study described in Chapter 4 specifically

investigated the association of participation in TANF with duration of enrollment in HV. The study tested the hypothesis that TANF participation at enrollment was negatively associated with duration of enrollment in HV.

Analyses conducted to fulfill Aim 1 found that nearly one-third of families enrolled in HV also participated in TANF. In unadjusted models, families who participated in TANF were enrolled on average for six months, whereas non-participants remained enrolled in HV for 7.5 months. Participation in TANF was not significantly associated with duration of enrollment in HV after adjusting for other characteristics. However, maternal age, prenatal enrollment in HV, and primarily speaking a language other than English were associated with longer durations of enrollment in HV.

The goal of Aim 2 was to investigate the content and referrals delivered to families early in their enrollment in HV and whether receipt of ESS services were associated with family characteristics. The study described in Chapter 5 investigated the extent to which home visitors delivered ESS services in the first three months and first year of enrollment to families at heightened economic risk as evidenced by their participation in TANF. The study tested the hypothesis that families who participated in TANF would receive ESS services sooner after enrollment in HV than families who did not participate in TANF

Analyses conducted to fulfill Aim 2 found that less than one-third of families received ESS services after three months of enrollment, and only half of families received ESS services even after one year of enrollment. Families who were enrolled in both HV and TANF received ESS

services at the same rate as TANF non-participant families. Among TANF participants, no family characteristics were associated with ESS receipt. Among TANF non-participants, speaking a language other than English, entering HV prenatally, and completing high school but not going on to higher education were associated with decreases in the rate of receipt of ESS services. Being married was associated with an increase in the rate of ESS service receipt.

The goal of Aim 3 was to better understand how services tailored to family ESS risks early in enrollment may influence retention in HV. The study described in Chapter 6 investigated the association of ESS services delivered during home visits with duration of enrollment in HV. The study tested the hypothesis that TANF participants who received ESS services would remain in services for a longer duration than families who participate in TANF but did not receive ESS services.

Analyses conducted to fulfill Aim 3 found that receipt of ESS services was associated with three weeks additional enrollment among families, but the observed increase in duration of enrollment did not differ between TANF participants and non-participants. Among TANF participants, maternal age and prenatal enrollment in HV were associated with longer durations of enrollment. Among TANF non-participants, maternal age and primarily speaking a language other than English were associated with longer duration of enrollment in HV.

Discussion

1. *Few families received ESS services in the first three months after enrollment, and only half of families received ESS services in the first year.*

This study hypothesized that ESS services were common and frequent. However, less than one-third of families in this study received ESS services in their first three months of enrollment, and only half of families received ESS services even after one full year of enrollment.

ESS services were investigated in this study because family ESS is a high priority outcome for HV. Families enrolling in HV often exhibit heightened economic risks, and federally funded HV programs are mandated to produce outcomes in this area. Programs are required by their models and funding to show improved outcomes in the area of family ESS. This is not the only priority for HV, however. Programs must also show improvements in areas that include maternal and child health, child abuse and neglect prevention, positive parenting, and child development and school readiness.[38] Sites may differ in their priorities based on their staffing strengths or limitations, prior performance in these areas, or the interests of leadership or staff. Home visitors' abilities and motivation to engage families to address risks may vary by type of activities and referrals that a family is determined to need.

In this study, the extent to which other high-priority services were delivered was not examined. A 2015 evaluation of HFNJ found that, across families, 29% of time was spent in child development or parent-child interaction content, 23% on healthcare content, and 28% on

administrative or unplanned content, leaving only 20% of time for any other topics such as ESS.[111]

ESS services were investigated in this study because many families cite access to job training and education resources as a main reason for enrolling in HV.[11,13,24,92] However, families enrolling in HV experience many challenges, and they may not perceive ESS to be their most important concern. Families may have immediate needs not limited to experiencing intimate partner violence, imminent homelessness, physical illness or injury, psychiatric problems, or child care access. Addressing any of these challenges may take precedence over education, employment, and financial content and referrals. In cases where families have goals for themselves that do not include ESS, home visitors may choose not to deliver ESS services.

2. Participation in TANF was not associated with rates of receipt of ESS services.

One goal of this study was to better understand the association of TANF participation with the ESS services delivered to families. This study used TANF participation as a marker for urgent education and employment needs. The study hypothesized that a higher proportion of TANF participants would receive ESS services when compared to non-participants, and ESS services would be received soon after enrollment.

Many families enrolled in HV also participate in TANF. A large proportion TANF participants were expected to receive ESS services soon after enrollment because of the strong partnership

between HV and TANF in New Jersey focused specifically on improving family ESS.[147] Mothers enrolled in TANF are required to achieve educational and employment goals established by the State of New Jersey's employment readiness standards.[67,69,144,145] Home visitors are encouraged to varying degrees by their local leadership and national models to tailor services to family assets and risks.[22,27,119,125] However, after adjusting for other family characteristics, TANF participation was not associated with the receipt of services tailored to ESS in the first three months or first year of enrollment.

Participation in TANF may be only one of many markers that indicate severe family ESS risk. Previous studies have found that most families enrolling in HV exhibit heightened economic risks.[7,28,37,40–42,74–83,88] Families who participate in TANF may not in fact have more ESS needs than families who do not participate in TANF. This study examined ESS service receipt in the first year of enrollment, but families may have greater motivation to pursue ESS goals if their two-year limit on TANF support nears or if they approach their five year lifetime cap on TANF receipt. The intersection of low educational attainment, employment challenges, and poverty may manifest in ways beyond simply participating in TANF. TANF participation may not be an adequate indicator to identify and differentiate families with severe ESS risks.

Alternatively, TANF participation may identify families who initially had higher ESS risks, but are no longer at high risk due to support by social service programs. TANF participants may not in fact be at higher ESS risk in the first year after enrollment to HV when compared to TANF non-participants. Family economic needs may be partially, though temporarily, met when families receive cash transfers through TANF. Families may receive ESS services through

TANF, so they may not need this type of service to also be provided by HV. Families with ESS risks who do not participate in TANF may continue to struggle with unmet ESS needs.

3. Few families remained enrolled in HV for one year or longer.

Longer durations of enrollment in HV programs has been associated with greater improvements in family outcomes, but programs often find it hard to retain at-risk families.[6–12] Healthy Families New Jersey (HFNJ) expects families to remain enrolled in services until a child is three years old. Other studies have found that programs face difficulties in retaining families in services for the length of time recommended by the model. Ammerman et al. followed 515 first-time mothers in HFA programs and found that 32% of families dropped out of the program before completion of their first month.[90] Other studies of HFA found rates of attrition of roughly 50% in the first year of the child's life.[18,40,78] Families in this study were expected to remain enrolled for the entire one-year follow-up period, but this study found that only two-fifths of families remained enrolled for one year.

4. Participation in TANF is not associated with the duration of enrollment in HV services.

One goal of this study was to investigate the association of receipt of ESS services with duration of enrollment in HV among TANF participants and non-participants. TANF participants were expected to remain enrolled in services for shorter durations when compared to non-participants.

TANF participants have been found to have exhibit more stressors overall,[101,104–106] especially employment or economic risks previously associated with shorter durations of enrollment in HV.[16,26,92,139] Programs have reported difficulties with retaining TANF participants in HV in particular.[59] Families may enroll in home visiting to fulfill their TANF requirements but may leave the program once they are successful in securing employment or if they exhaust their TANF benefits.

In bivariate measures, TANF participation was associated with a shorter duration of enrollment and fewer visits among families in the sample. Only one-quarter of TANF participants remained enrolled for one year after enrollment compared with roughly 40% of TANF non-participants. Families who participated in TANF were enrolled on average for less than six months, whereas non-participants remained enrolled in HV for nearly 7.5 months. After adjusting for covariates and clustering by site, however, TANF participation was not associated with the duration of family enrollment.

The reasons that TANF participants and non-participants disenroll from HV vary. TANF participants were more likely to leave HV when they encountered an ESS success such as entering an educational program or gaining employment, indicating that TANF participants are supported to achieve ESS goals. However, a higher proportion of TANF participants refused outright to continue services after their initial visit when compared to TANF non-participants. This could be because the needs of TANF participants were adequately met by TANF and so they did not want additional support. HV programs report significant difficulties in retaining TANF participants in services if they exhaust their TANF benefits.[59,61] TANF participants may

have had less interest in the topics covered in home visits. They may be overburdened with requirements for compliance imposed by TANF participation, and so were unwilling to engage in additional social support programs.

5. *Receipt of ESS services in the first three months of enrollment was associated with a three week increase in duration of enrollment in HV.*

One goal of this study was to assess the association of receipt of ESS services in the first three months after enrollment to HV with duration of enrollment. Prior studies have found that many families cite access to employment and educational resources as reasons for enrolling in HV.[11,13,91,92]

In this study, receipt of ESS services in the first three months was associated with over three weeks of additional enrollment in HV. However, a low proportion of families received ESS services in the first three months of enrollment, and programs experienced high rates of attrition in the first year. HV programs have an opportunity to increase family duration of enrollment by delivering ESS services to families soon after they enroll in HV.

Families are recommended to receive visits every week or two weeks during the first year of services, and may receive visits more frequently as indicated.[147] A three week increase in duration of enrollment may mean that families receive between one and four additional home

visits that equate to between one and six additional hours of face-to-face contact with a home visitor. The increased dosage of services may have clinical relevance for families.

6. *Increases in duration of enrollment associated with ESS service receipt did not differ between TANF participants and non-participants.*

This study hypothesized that receipt of ESS services in the first three months after enrollment in HV would be associated with a longer duration of enrollment for families who were at elevated economic self-sufficiency risk as evidenced by participation in TANF when compared with families who did not participate in TANF. When services are tailored to address family characteristics and needs, families may feel more satisfied or engaged in services. Other studies have found that satisfaction with services increases as content becomes more tailored to individual family characteristics, and that that this relationship influences the duration of family enrollment.[35–37]

After adjusting for covariates and clustering by site, this study found that TANF participants 1) did not exhibit increased risk of attrition; 2) did not receive increased rates of ESS services; and 3) did not achieve greater increases in duration of enrollment associated with receipt of ESS services when compared to TANF non participants. This study found that receipt of ESS services was associated with over three weeks additional enrollment for families. Both TANF participants and non-participants remained enrolled in services longer if they received ESS services soon after enrollment, but the improvements in retention associated with receipt of ESS

services were not greater for TANF participants. Both HV and TANF focus on improving ESS outcomes specifically for families determined to be at heightened ESS risk. Where HV research identifies subgroups of families at heightened ESS risk or at increased risk for attrition, HV programs may want to target these families with ESS services. HV programs may want to deliver ESS services to all families soon after their enrollment in HV to maximize retention.

7. *The effect of primary language varied by TANF participation for both ESS service receipt and duration of enrollment in HV.*

This study found that family characteristics beyond TANF participation influence receipt of ESS services and duration of enrollment in HV. This study corroborates other research that found associations between characteristics such as maternal age,[21,30,115,148] prenatal enrollment,[13,14,22,90,114,118] and marriage[13,112,149] with longer durations of enrollment. This study found strong associations between primarily speaking a language other than English with both ESS service receipt and duration of enrollment. Other studies have found that Latina mothers in general are more likely to remain enrolled in HV for longer periods than African-American or European-American mothers.[21,26,114,115] Monolingual non-English speaking families may continue their enrollment in HV because home visitors can provide support and translation assistance and linkages to other social services.[30,109,115] The findings of this study for primarily non-English speaking families in particular are discussed below.

ESS services among primarily non-English speaking families

Families who primarily spoke a language other than English showed lower rates of ESS service receipt in adjusted models. Home visitors may not be able to communicate easily with families in their caseload if they are not from the same linguistic background, and therefore may be less likely to deliver content or referrals that require complicated conceptual or instructional exchanges. Families who are primarily non-English speaking may vary in their interest in ESS services due to different cultural norms around working or going to school as a mother.

In addition to parenting and family support, HV is often able to provide services that help non-English speaking immigrants integrate into primarily English speaking settings. Home visitors may choose to deliver content or referrals focusing on topics such as English language fluency, translation or interpretation services, or immigration support to these families.[30,109,115] Some HV programs may not offer ESS services in primarily non-English speakers' native languages, or referrals may not be useful to families if they do not offer multilingual services. Families who do not primarily speak English may not be able to access the referrals that HV programs provide if these external agencies do not provide services in the languages spoken by families or if they do not meet residency or citizenship requirements. Primarily non-English speaking families may be newer arrivals to the U.S. who have needs that extend beyond ESS services.

Duration of enrollment among primarily non-English speaking families

No studies were identified in the course of this research that investigated the association of TANF participation with duration of enrollment in HV among non-English speaking families. In

this study, TANF participation was associated with a 50% increase in the risk of attrition among primarily non-English speaking families. There may be important unobserved differences between non-English speaking families who do and do not participate in TANF.

TANF participation in non-English speakers may serve as a proxy for other characteristics associated with duration of enrollment. Some HV programs may not offer services in primarily non-English speakers' native languages, which may be a barrier to continued enrollment in HV for families with lower levels of English literacy. TANF participation among primarily non-English speaking families may indicate higher English proficiency needed to navigate the complex and mostly English-speaking system of applications, paperwork, and interviews necessary to enter TANF.

Families may remain enrolled in HV services for shorter durations if services are not well-aligned with family attitudes, knowledge, and beliefs. Primarily non-English speaking families who choose to participate in TANF may hold cultural beliefs and norms that are more aligned with the messaging of U.S. social systems when compared to non-English speaking TANF non-participants. Participation in TANF may be a marker of immigration and social integration. Primarily non-English speaking families may be excluded from the wider network of social services because of residency or citizenship requirements. Among immigrants to the U.S., the model of home visitation may be familiar and trusted. Home visitors may resemble highly respected community health workers, or *promotoras*, which are prevalent in many immigrants' countries of origin.[32,116] Also, home visitors may be perceived as surrogate extended family members for clients whose biological families may be separated by national borders.[30,109,115] As

a result, they may place more significance on their HV enrollment as a linkage to a formal social service.[115]

The reasons the associations in service receipt and duration of enrollment with primarily speaking a language other than English should be interpreted in light of the complex challenges faced by families enrolled in HV. Understanding the relationship between family characteristics, the services received in visits, and duration of enrollment is crucial to improve participation and outcomes for families.

Strengths and Limitations

This study is a contribution to literature investigating service delivery and retention in HV specifically and social services more generally. This study should be interpreted in context of its strengths and limitations.

Strengths

This study was undertaken to address difficulties in family retention in services that have been expressed by HV programs themselves.[59] The study focused on two programs working in partnership to achieve well-aligned goals to improve family ESS. The findings of this study can be directly translated to practice in order to inform retention initiatives in HV.

The data source in this study is strong. Secondary analysis of Healthy Families New Jersey data is cost-effective, naturalistic, and timely; HFNJ administrative data are generally usable within

three months of a delivered service. Administrative data contains temporally situated data points and allowed for clarity of temporal sequence in the study. Multiple measures of content delivery (e.g. topics discussed in a visit, referrals to specific resources) were used to triangulate service receipt at each individual home visit. Administrative services, demographic characteristics, and duration of enrollment in the program were likely to be accurately ascertained and recorded due to the existence of sophisticated, standardized, statewide management information system with continuous quality improvement initiatives for service delivery and data. Families who participated in TANF were likely to be identified early in enrollment due to the shared funding between TANF and HFNJ.[64,135,147,150] The data also captured family characteristics at multiple steps of intake and early enrollment: at referral, initial screening, follow-up screenings, and intake. Where data were missing on one form, they were often found on other forms, decreasing misclassification bias.

This study was methodologically strong. This study used survival analysis to investigate how delays in receipt of services influenced family retention in HV. Survival analysis is a useful modeling strategy for administrative data, where temporal sequencing of data is useful to model how the passage of time influences the risk of event occurrence. Few studies of home visiting have used survival analysis as a method of investigating duration of enrollment in services, even though data and research questions are well-suited to this method.[22,151]

Due to its large sample size, this study was able to cluster by HV site in all adjusted models. Some unobserved measures, such as residential mobility or neighborhood poverty levels, may have improved the prediction of attrition. Service delivery may have been influenced by the

availability of referral resources in a community or site-specific home visitor training. Clustering by site may have reduced some of these geographic effects.

Limitations

Several limitations are noted. Administrative data are limited by several factors. The data collected were entered by home visitors for routine case management and not designed to address the research questions of this study. Dosage of ESS services received, such as the proportion of visits that included ESS services, was not included in this study. Some covariates were not available or exhibited large amounts of missingness. Severe economic risk might have been improved by measures of family wealth, household income, head of household employment status, current enrollment in educational programs, and family debt, but these measures were not available in the data. TANF eligibility was not assessed in this study. Some families may have already met their five year lifetime cap for TANF receipt or may have recently completed a two year receipt limit, but de-identified study data were unable to be linked with TANF administrative data to determine eligibility. Understanding the distribution of racial background, nativity, country of origin, and years in the U.S. may have added context to measures of primary language used in this study.

Some covariates were based on mothers' self-report to the home visitor. The measure of primary language was based on mothers' self-report to the home visitor, but English proficiency was not measured. Some families may have been bilingual and well-integrated into English-speaking settings but choose to speak another language in the home. Other families may have lacked basic English ability. Measures of acculturation, immigration status, and citizenship were not

available in this study, but there may be important unobserved differences between primarily non-English speaking families across TANF participation status. Grouping the large number of Spanish speakers with speakers of other languages may have obscured the experiences of both groups in service delivery. Many social services are available in Spanish but not in other languages such as Swahili or Mandarin.

Generalizability to families in other HV programs is limited. This study would ideally include all families enrolled in any HV program in the U.S. However, data were limited in this study to one model (Healthy Families) within one state (New Jersey). Families with medical or other targeted risk factors may be differentially referred to home visiting or specific home visiting models other than Healthy Families, such as programs staffed by nurses. This study includes only one home visiting model because other program models either do not collect or do not provide the same level of detail about program content and referrals. Although this study is limited in generalizability, the program under investigation serves the largest number of families in New Jersey and findings, therefore, may be generalized to a larger population within New Jersey than results from studies of other programs.

Families may have different goals for their enrollment in HV or pressing needs for services that are not education, employment, or financial in nature. Investigating plans that a family and home visitor may write together, such as an Individual Family Service Plan, are beyond the scope of this study. Future studies of HV enrollment continuation could be enhanced by including qualitative data regarding family perception of needs, how families participate in

setting the service delivery plan, how families respond to the alignment of HV services with these needs, and reasons for discontinuing enrollment in HV.

Implications for Policy and Practice

The findings of this study have implications for policies and practice that aim to improve services and retain families in HV.

Policy

Programs and models across the country struggle to retain families in HV. The ways that tailoring services to family characteristics may improve family retention in services is a priority nationwide. As a result, the findings of this study are likely to be of significant national interest. Healthy People 2020 sets goals for improvements in maternal, infant, and child health, as well as early and middle childhood.[152] The Affordable Care Act required that MIECHV Programs focus their efforts on improving outcomes for families through individualized assessments and services.[153] Receiving ESS services earlier in enrollment led to measurable improvements in retention for all families. National models may consider incorporating increased flexibility in their service delivery model to encourage experimentation in finding the ideal mix of services across families who exhibit specific characteristics.

The findings of this study may also provide guidance for partnership efforts between TANF and HFNJ. This study found that many TANF participants in this study did not receive ESS services even after one full year of enrollment, and that TANF participants receive ESS services at rates

that are undifferentiated from that of TANF non-participants. Both HFNJ and TANF have set goals with measurable outcomes in the area of family ESS.[38,69,146] TANF provides funding to HFNJ to provide ESS and family support services, but the partnership between TANF and HFNJ is being re-conceptualized.[62,66,68,135] This study identifies opportunities to re-visit and re-align goals and service delivery for ESS between TANF and HV programs.

Practice

Programs may use the findings of this study to inform their decisions about how, when, and to whom to deliver services. The findings of this study suggest that some content and referrals may be of universal interest to families, and programs may want to deliver these services to families regardless of their program-identified needs. The time spent in delivery of ESS services during a home visit means that there is less time for other service types. Programs may be interested in whether some family characteristics or types of content are more important than others when creating the service delivery plan. The findings of this study suggest that ESS services may have wide appeal among families in HV. This study found that families remained in services for three additional weeks on average if they received ESS services in the first three months after enrollment. Delivering ESS services to families soon after enrollment may be a strategy by which programs can improve retention in services.

The findings from this study may be used to revise enrollment and retention expectations in programs. In light of widespread attrition in HV programs across the country, programs may be interested in revisiting their goals for the ideal duration of family enrollment. Perhaps it is unrealistic to expect families to commit to multiple years of engagement with HV, or that the full

duration of enrollment must be completed in order to achieve the benefits of participating in HV. No studies have been conducted to determine the minimum length of time to establish program effectiveness. Programs instead operate under the assumption that the recommended duration of enrollment is required to achieve optimal outcomes for all families.[30,154]

Programs typically recommend that families enrolled in HV receive services for several years. New Jersey set a goal of 60% retention of families at one year after enrollment in HV.[111] The national Healthy Families America model recommends enrolling families for the first three years of a child's life.[39,133] This study used a conservative definition of attrition, but still found that found that half of families remain enrolled in HV for at least one year of services. New Jersey has set a realistic goal for retention based on the proportion of families experiencing attrition in HV programs. Widespread family attrition may be interpreted as the opinion of families that HV services are needed for shorter than the recommended duration. Programs may be interested in using the findings of this study to inform their decisions about: 1) whether a shorter or more intensive period of home visiting might achieve the same outcomes seen by programs today; 2) by what family characteristics the ideal duration of enrollment varies.

Implications for Research

These findings may inform research about services delivered and retention in HV. Conceptual and methodological implications are discussed below.

Conceptual implications: Implementation research and program fidelity

This study did not determine that tailoring services to ESS needs as indicated by TANF participation was associated with improvements in retention in HV. However, the study provides a model by which tailoring services other family characteristics may be investigated to answer this question. This study also identifies ESS services as an important contributor to family retention in HV.

Home visiting programs increasingly acknowledge that one size does not fit all.[155] As a result, HV research is increasingly focused on what interventions work, for what type of family, at what times, in what contexts, and why.[46] Implementation research is a field of scientific inquiry devoted to the description and investigation of factors that influence the full use of innovations in practice.[156–158] This study investigated how services are delivered to meet family ESS needs, the ways ESS services were differentiated between families who participated and did not participate in TANF, and whether receipt of ESS services was associated with the duration of enrollment in HV.

Service tailoring is the purposeful variation in a program's intended model and service content as it is adapted to family characteristics, risks, and assets through ongoing shared decision making and agenda setting.[16,19,23,117,118] Service tailoring requires a dynamic selection of services that are adapted to family characteristics. Service tailoring requires a sophisticated balancing act between fidelity (adherence to a prescribed model) and adaptation (altering services to increase relevance in a new context).[117,158,159] Fidelity is the extent to which the delivery of an intervention is a reflection of the original model.[160,161] There are five major dimensions by

which home visiting fidelity might be examined: 1) adherence to original program components; 2) dosage of services; 3) quality of services; 4) family responsiveness; and 5) program differentiation.[160,161] Service tailoring may lead to unintended effects on the program by altering the delivery of core components or the dosage of services. Some proponents of fidelity argue that adherence to a program's intended model is necessary in order to achieve outcomes.[162] However, other research has found that adapting a program and its services to local or family characteristics may also be necessary to achieve relevance in across the diverse settings in which the program is implemented.[163,164]

This study aims to add to the body of implementation research by investigating the relationships between family characteristics, actual services delivered in home visits, and duration of enrollment in HV. Home visitors, supervisors, and staff must maintain fidelity to their intended model(s) while negotiating the delivery of core content to families, the co-selection of additional content by family and home visitor, and the actual delivery of services. The amount of variability in services expected by a model can greatly influence whether the program is determined to have been implemented with fidelity. A large amount of variability in service content and referrals may reflect adherence to a program model that intends a high level of service tailoring; conversely it may reflect non-adherence to a model that intends to provide a narrow range of services.

Methodological implications: Measuring family duration of enrollment in HV

This study has implications for standardizing the measurement of family duration of enrollment in HV. This study employed a more restrictive criteria for duration of enrollment than most

other studies that use program discharge dates to estimate family duration of enrollment. Sensitivity analyses conducted in the course of this research (see Appendix G) found that home visiting programs continue outreach to families long after families disengage from services. Families are not formally disenrolled from programs while this outreach occurs. For this reason, home visiting programs' estimates of length of family enrollment exceeds estimates of family duration of enrollment when subtracting first visit date from final visit date.

Most studies use the formal date of discharge from the program to approximate the end of family participation in services. The formal discharge date is often not the same as the date of the final home visit. Some families are disengaged from services but remain enrolled in HV while programs conduct creative outreach efforts to re-engage them.[140] Where this occurs, the date of last visit and discharge dates may be separated by wide intervals of time.[8,9,83,140] Most studies of HV use formal discharge dates recorded by programs to calculate duration of enrollment, but this overestimates family contact with programs. In this study, duration of enrollment was overestimated by program discharge records for 36% of families when using formal discharge dates, with 15% overestimating at least six months additional enrollment. As a result, the proportion of families in this study who remain enrolled at post-enrollment periods may appear to be lower than that of other studies that overestimated the duration of receipt of home visits. Standardizing measures of enrollment and discharge is critical to understanding the impact of duration of enrollment as a predictor and outcome across studies.[6,16,18,24,42,85,111,165,166] Future studies should use a measure of duration of enrollment that most closely approximates the actual amount of time that a family was engaged in services.

Future Directions

The findings of this study may inform future research in the areas of service tailoring and retention in HV. Many types of services may be investigated for potential alignment with family characteristics, and observed tailoring may be tested for associations with outcomes including but not limited to duration of enrollment. Dosage of ESS services may be measured by creating indicators of the amount of time spent in specific content areas, the number of referrals provided to a particular service, or the proportion of visits that included a specific type of content or referral. Dosage of ESS services received may be included in future studies to determine whether frequent and repeated content or referrals are associated with family outcomes.

Future studies of HV enrollment continuation could be enhanced by linking HV administrative data to other family service data systems. Medicaid, child welfare, and other social services also record service delivery information and family characteristics. Linking these data could validate measures of family characteristics as well as improve identification of the types of services that families receive across multiple interconnected social service agencies. This study did not investigate whether HV attrition coincided with the timing of TANF attrition as anecdotally reported by programs.[59,61] The de-identified data used in this study were unable to be linked with TANF administrative data. Future studies may include whether families continued their TANF enrollment while terminating their HV enrollment, whether families were currently eligible for TANF, or whether families had participated in TANF in the past.

Future studies may benefit from including quantitative measures not available in this study. Studies may use a more comprehensive measure of severe ESS risk than the one used in this

study. TANF participation may be only one indicator of ESS risk among families enrolled in HV. Severe economic risk might have been improved by measures of family wealth, household income, head of household employment status, current enrollment in educational programs, and family debt that were not available in the data. Understanding the distribution of racial background, nativity, country of origin, and years in the U.S. would have added context to measures of primary language used in this study. Future studies may include measures of acculturation, immigration status, and citizenship were not available in this study. Studies with large sample sizes may consider including primary language as a categorical rather than binary variable. Grouping the large number of Spanish speakers with speakers of other languages may have obscured the experiences of both groups in service delivery.

Greater attention into subgroups that remain enrolled for longer durations in HV could provide instruction for programs seeking to improve family retention. This study found that older maternal age, prenatal entry, and primarily speaking a language other than English was associated with longer durations in HV when adjusting for other covariates. A closer examination of these subgroups in particular may provide an opportunity to improve family satisfaction with services.

Future studies of retention in HV could be enhanced by including qualitative data regarding family perception of needs, how families participate in setting the service delivery plan, how families respond to the alignment of HV services with these needs, and reasons for discontinuing enrollment in HV. Studies may want to investigate plans that a family and home visitor write together, such as a Family Goal Plan, in order to determine whether a family truly received

services that aligned with their self-identified goals. Understanding what families want from HV services is a crucial step in understanding how services meet family expectations. Families' desires may change during their time enrolled in HV, and so including family perspectives at multiple time-points throughout enrollment in HV could provide a longitudinal and complex look into how services respond to family desires.

Conclusion

HV serves families with diverse characteristics who live with social, economic, biologic, and behavioral health adversity. Improving family ESS is a high priority for both HV and TANF.[38,146] However, few families received ESS services in the first three months after enrollment. HV programs recommend that families remain enrolled for several years, but retention in programs is a challenge. This study was undertaken to better understand how tailoring services to ESS risks early in enrollment in HV may influence retention in HV. The findings of this study may be used to strengthen the alignment of HV and TANF priorities to help families achieve ESS goals.

This study found that families who received services related to ESS remained enrolled in services longer than families who do not receive ESS services. However, the association between ESS service receipt and increased duration of enrollment did not differ by TANF participation. All families enrolling in HV may experience challenges related to education, employment, and finance, regardless of their participation in TANF. Understanding the relationship between family ESS risks, TANF participation, and duration of enrollment is crucial

to improve outreach, retention efforts, and outcomes for families in HV services. HV programs have an opportunity to increase family duration of enrollment by delivering ESS services to families soon after they enroll in HV. The findings of this study may inform retention efforts that focus on improving services delivered to families enrolled in HFNJ as well as home visiting nationwide.

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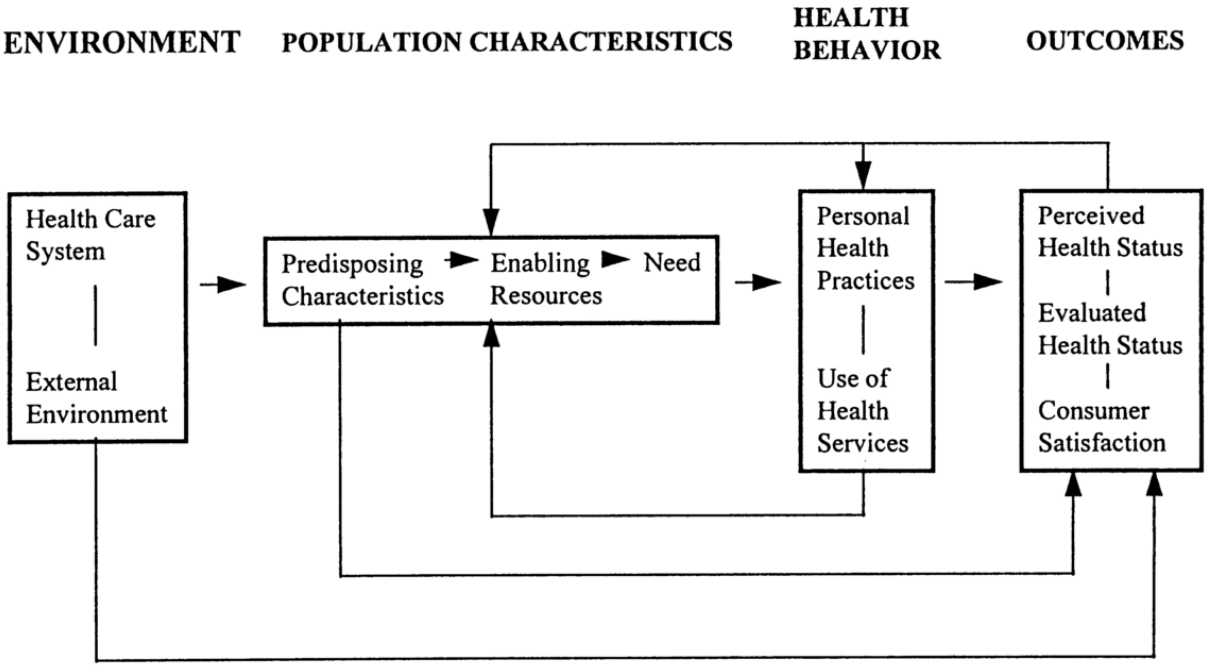
Appendices

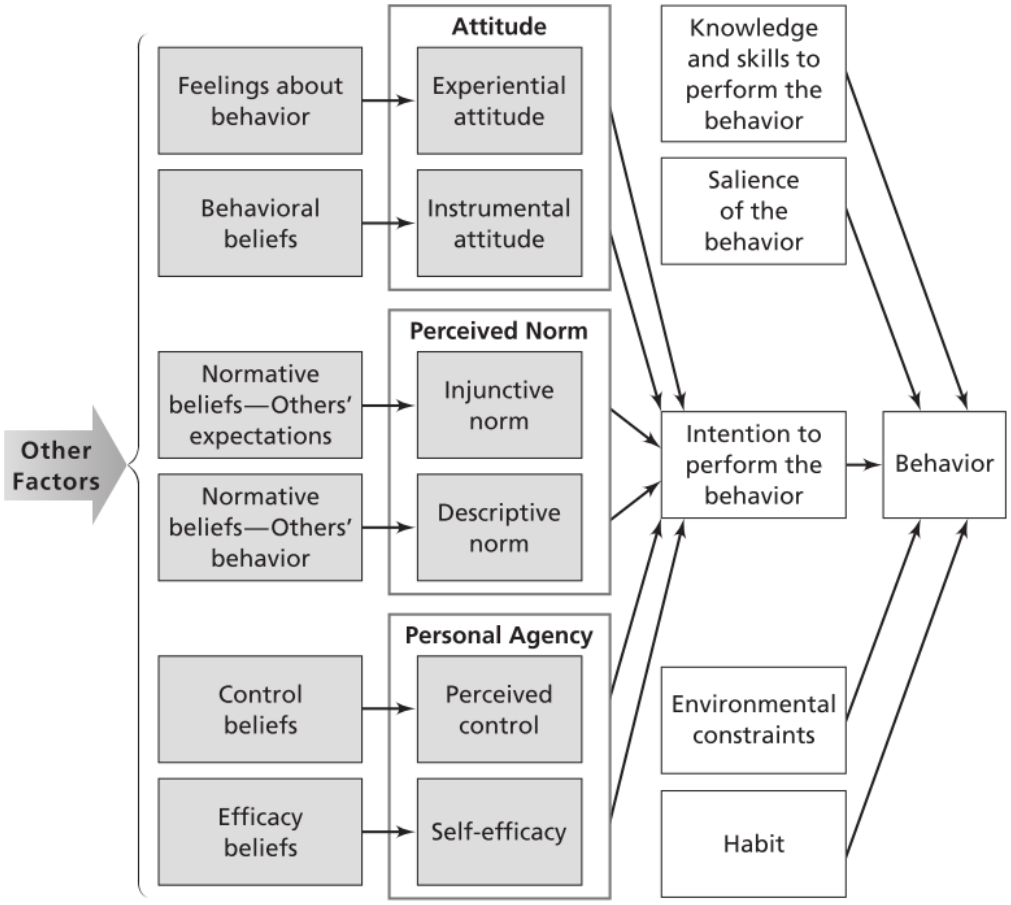
Appendix A: Conceptual Frameworks Informing the Study

Figure A.1. The Andersen Model of Health Services Utilization



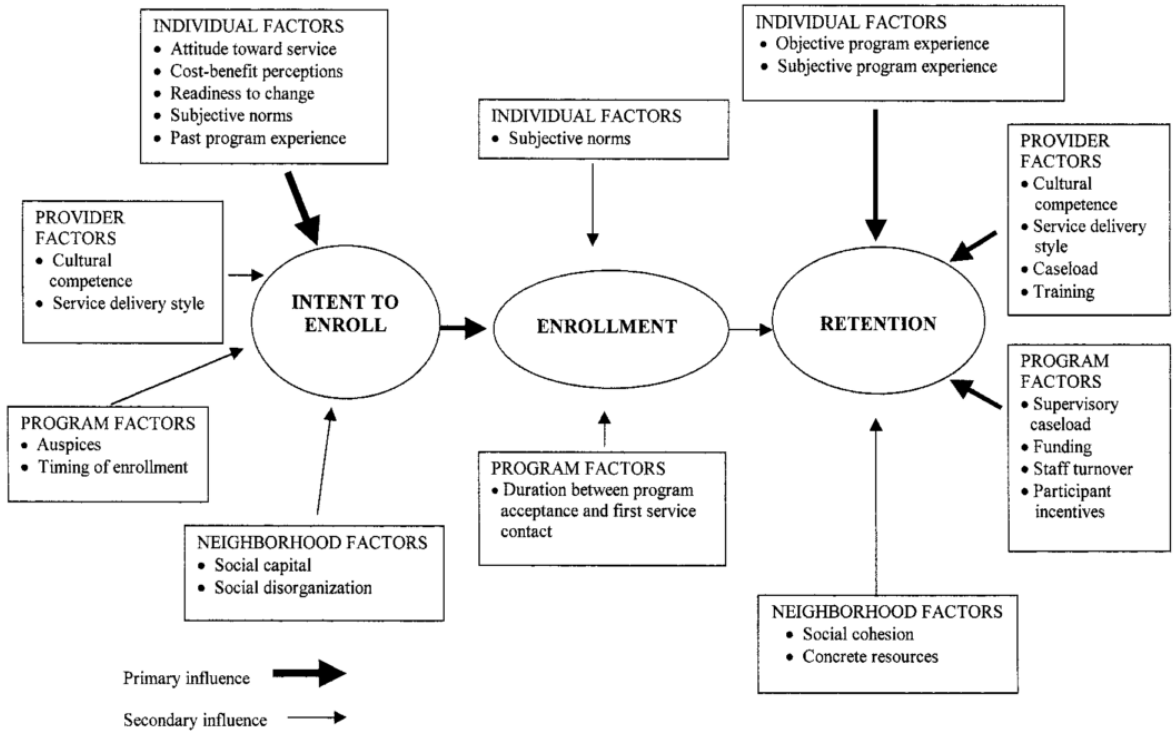
From: Andersen RM. Revisiting the Behavioral Model and Access to Medical Care: Does it Matter? *J Heal Soc Behav*. 1995;36(1):1-10.

Figure A.2. The Integrated Behavior Model



From: Glanz K, Rimer BK, Viswanath K, eds. *Health Behaviour and Health Education: Theory, Research, and Practice*. 2nd ed. San Francisco, CA, USA: John Wiley & Sons, Inc; 2008. doi:10.1016/S0033-3506(49)81524-1.

Figure A.3. Integrated Theory of Parent Involvement



From: McCurdy K, Daro D. Parent Involvement in Family Support Programs: An Integrated Theory*. 2001;50(2):113-121. doi:doi:10.1111/j.1741-3729.2001.00113.x.

Appendix B: Analytic Variables

Table B.1: Analytic variables used in the study

Aim			Variable	Operational Definition	Response Categories	Format
Ind.	Dep.	Cov.				
1, 2, 3			TANF participation	Whether a family was determined to participate in TANF, or to have joined the TANF program, within one month of enrollment to HFNJ	No; Yes	Binary (x2)
3	2		ESS services in the first three months	Whether the family had any visit with ESS services in the first three months of enrollment	No; Yes	Binary (x2)
3	2		ESS services in the first year	Whether the family had any visit with ESS services in the first year	No; Yes	Binary (x2)
3			Time to delivery of ESS services	The number of days from enrollment to the first instance of receipt of ESS services	0-365	Interval
	1, 3		Duration of enrollment	Number of days enrolled in HFNJ between intake and final visit dates	0-365	Interval
		1, 2, 3	Maternal age	Years between maternal birthdate and intake date	14-48	Interval
		1, 2, 3	Prenatal entry to HV	Whether the family entered the program before the birth of the child	No; Yes	Binary (x2)
		1, 2, 3	Educational attainment	Highest level of maternal education	< High school graduate; High school graduate or GED; Some college, Vocational/ Associate/ Bachelor degree or more	Ordinal (x3)
		1, 2, 3	Employment status	Maternal employment at enrollment	No; Yes	Binary (x2)
		1, 2, 3	Poor maternal mental health	Whether a mother was identified at assessment or intake as having poor maternal mental health	No; Yes	Binary (x2)
		1, 2, 3	Primary language	Primary language spoken in household	English, Spanish/Other	Binary (x2)
		1, 2, 3	Marital status	Maternal marital status	Unmarried; Married	Binary (x2)
		1, 2, 3	Parity	Number of births at entry to HV	0, 1, $\geq$2	Ordinal (x3)
		1, 2, 3	Family Survey Score	Maternal Family Survey score	0-80	Interval

Appendix C: Administrative Management Information System Data Collection Forms

Table C.1: Components of management information system

Form	Definition	Type of Questions	Timing
Family and Home Visit			
Intake	Contact, demographic, education, employment, medical, public benefits, and family composition data for primary caregiver(s)	Closed-ended	At family enrollment
Benefits Status Change	Change in TANF enrollment after enrollment in HFNJ	Closed-ended	When TANF benefits change
Discharge Form	Documents family discharge date and reasons for discharge, as well as optional closure summary notes	Open- and closed-ended	At family discharge
Family and Child Services or Screenings			
Screen	Contact and risk factor information about referred families	Closed-ended	At family referral to home visiting
Family Survey, formerly Kempe Family Stress Inventory	Psychosocial interview that measures risk for parenting difficulties such as psychiatric history, emotional functioning, attitudes toward and perception of child, and parent stress levels[73]	Open-ended semi-structured interview	At family referral to home visiting
Home Visit Log	Four-page structured form outlining visit timing, type, activities, and notes	Open- and closed-ended	After every attempted or completed home visit
Service Referral	Any family member's referral to another program or agency outside HFNJ	Closed-ended	Each time family member is referred to a service

Table C.2: Home visit log content and referral areas

Content in Home Visit	Economic Self-Sufficiency Service Category
Program Activities	
Introduce program/complete forms	
Administer Parents as Teachers curriculum	
Discuss level change/home visiting frequency	
Discuss graduation/transition planning	
Update/complete developmental milestones	
Update/complete Follow-Up Form	
Update/complete Benefits Status Change Form	
Other (Specify ___)	
Concrete Activities	
Provide or arrange for food, clothes, diapers, or household goods	
Provide or arrange for transportation	
Provide information and/or assistance with housing	
Provide employment information/help parent(s) look for job	Employment
Provide information on educational and training options	Education
Provide translation services	
Provide information and/or assistance on economic self-sufficiency/financial literacy	Financial
Provide advocacy/support and/or accompany to medical providers and services	
Provide advocacy/support and/or accompany to non-medical providers and services	
Other (Specify ___)	
Screening Tools	
Administer ASQ	
Share ASQ screening results with family	
Administer ASQ-SE	
Share ASQ-SE screening results with family	
Administer hearing screening	
Share hearing screening results with family	
Administer vision screening	
Share vision screening results with family	
Administer HOME Scale	
Discuss HOME results with family as needed	
Administer Infant/Child Home Safety Checklist	
Share Home Safety Checklist results with family	
Administer domestic violence screening	
Share domestic violence screening results with family	
Based on domestic violence screening, develop safety plan	
Administer substance use screening	
Share substance use screening results with family	
Administer mental health screening	
Share mental health screening results with family	
Other (Specify ___)	

Table C.2, continued: Home visit log content and referral areas

Content in Home Visit	Economic Self-Sufficiency Service Category
Parent-Child Interaction	
Provide unborn baby development information	
Provide developmentally appropriate toys, books, or activities	
Provide education, information, or activities on child emerging development and age-appropriate behavior during the coming months	
Share observations with parent(s) regarding their strengths in responding and interacting with their baby	
Provide connections between the parent's behavior and the child's developmental level	
Partner with parents to identify and develop parenting strategies that are consistent with their family values and culture	
Encourage parent reflection on the source of their parenting behaviors and values and set goals for growth	
Facilitate opportunities for parents to practice specific parenting behaviors	
Other (Specify ___)	
Development-Centered Parenting	
Provide information on attachment and brain development	
Discuss ways the parent(s) can develop a secure attachment with their baby	
Provide infant massage information	
Provide information on the sensory systems in infants	
Address infant basic care needs (bathing, diapering, dressing, etc.)	
Discuss Shaken Baby Syndrome (Period of purple crying)	
Provide discipline information	
Discuss positive discipline and setting limits, including temper tantrums	
Provide child health care and medical home information	
Discuss immunization status	
Discuss well-baby visits	
Discuss child sick care	
Discuss physical fitness in infants and toddlers	
Provide vision development information	
Provide dental health information	
Provide information on hearing and auditory development	
Provide breastfeeding information and support	
Provide infant/child feeding information and support	
Provide information and equipment relating to safe and healthy home environments (i.e. car seats, child proofing, homemade toys, etc.)	
Discuss hazardous substances and neurotoxins	
Provide safe sleep information	
Discuss sleep and infant/toddler development	
Provide child stress and transitions information	
Discuss temperament and ways the parent(s) can support their child's temperament	
Provide toilet learning information	
Provide prenatal care and nutrition information	
Discuss ways the parent(s) can develop a secure prenatal attachment with their baby	
Discuss substances that can harm an unborn baby	
Provide information on prematurity	

Table C.2, continued: Home visit log content and referral areas

Content in Home Visit	Economic Self-Sufficiency Service Category
Provide information on brain development and windows of opportunity Discuss differences and delays in development Discuss developmental concerns identified by parent Provide bilingualism information Discuss sexuality awareness Other (Specify ___)	
Family/Social-Emotional/Economic Well-Being	
Discuss childcare options and issues Discuss child welfare and services (TANF/GA/EA/WIC) Discuss child support issues Discuss employment and training Discuss household income/financial literacy Discuss family-centered assessment strengths/needs Discuss goals, develop goal plan Discuss problem-solving and decision-making skills Provide information on the effects of technology on young children and families (i.e. TV, computer, etc.) Provide information and support on family diversity topics (fatherhood, grandparents, immigrant families, etc.) Provide general health information Provide information on health providers or services Provide family planning, safe sex, or STI information Discuss smoking cessation Discuss mental health issues Discuss substance and alcohol use issues Discuss domestic violence issues and safety planning Discuss child abuse and neglect issues	Employment Financial

Referrals in Home Visit	Economic Self-Sufficiency Service Category
Health Care	
Adult primary care Child primary care Dental services Family planning HIV testing Early Intervention (EIP) Attention Deficit/Hyperactivity/Behavior Disorder Immunization Lead testing Lead follow-up services Prenatal care Postpartum care Pregnancy testing Public health nursing STD testing Family/Child Health Plus	

Table C.2, continued: Home visit log content and referral areas

Referrals in Home Visit	Economic Self-Sufficiency Service Category
Developmental screening and services	
Other health service	
Breastfeeding support	
Smoking cessation	
Nutrition	
Food pantry/Food co-op/Discount food	
WIC	
Nutritional counseling	
Public Benefits	
TANF	
Food stamps	
Medicaid	
Emergency assistance	
SSI	
HEAP (Energy assistance)	
General assistance (GA)	
Family and Social Support Services	
Childbirth education	
Parenting education/training	
Day care/baby-sitting	
Parent aide services	
Recreational services	
Head Start	
Fatherhood services	
Family Success Center	
Employment, Training, and Education	
Adult basic education	Education
ESL (English as Second Language)	
GED preparation	Education
Special education	Education
Vocational or job skills training	Employment
College	Education
Other educational services	Education
Job readiness/employability skills	Employment
Job search and placement assistance	Employment
Work experience	Employment
OneStop	Employment
Counseling and Intensive Support Services	
Psychiatric or psychological treatment	
Other mental health counseling	
Domestic violence services	
Substance abuse services	
HIV support/counseling	
Support groups	

Table C.2, continued: Home visit log content and referral areas

Referrals in Home Visit	Economic Self-Sufficiency Service Category
Mediation Division of Child Protection and Permanency Differential response	
Concrete Services	
Clothing, furniture, other household items Housing assistance/emergency shelter Transportation	
Other services	
Legal services Money management Immigration services Translation services Other services (specify) Case management	Financial

Appendix D: MIECHV Benchmarks and Constructs

Table D.1: MIECHV constructs and New Jersey's definition of improvement

Construct[38]	**Domains**[146]	**New Jersey's Definition of Improvement**[146]
1. Improvement in maternal and newborn health	1.1 Prenatal care	Proportion of participating mothers who enroll in home visiting services no later than 28 week gestation with adequate prenatal care based on APNCU Index
	1.2 Parental use of alcohol, tobacco, or illicit drugs	Proportion of mothers who completed PRA screening tool
	1.3 Preconception care	Proportion of participating mothers completing a postpartum medical visit by 8 weeks postpartum
	1.4 Inter-birth interval	Proportion of participating mothers who receive education on birth spacing
	1.5 Maternal depressive symptoms	Proportion of mothers with a completed depression screening tool during the initial 8 weeks of enrollment
	1.6 Breastfeeding	Proportion of mothers who breastfeed their 4 week old infants
	1.7 Well-child visits	Proportion of participating target children who have had a 6 month well-child check up
	1.8 Maternal and child health insurance status	Proportion of participating mothers and children covered by private or public health insurance
2. Reduction in child injuries, abuse, and neglect	2.1 Visits for children to emergency department	Rate of emergency department visits for enrolled children
	2.2 Visits for mothers to emergency department	Rate of emergency department visits for enrolled mothers
	2.3 Information and training on prevention of child injuries	Percentage of participant families provided information or training on prevention of child injuries
	2.4 Child injuries	Incidence of child injuries requiring medical treatment
	2.5 Reports of suspected maltreatment	Rate of reported suspected maltreatment for children (0-84 months) in the program
	2.6 Reports of substantiated maltreatment	Rate of reported substantiated maltreatment of participating children (0-84 months)
	2.7 First time victims of maltreatment	Rate of participating children (0-84 months) reported as first time victims of maltreatment during the time period
3. Improved school readiness and achievement	3.1 Parent support for child learning and development	Percentage of caregivers scoring above the lowest quartile on the Toddler (IT) HOME subscale scores for parent support for children's learning and development assessed at 6 months
	3.2 Parent knowledge of child development	Percentage of caregivers scoring above the lowest quartile on the IT-HOME (total) score assessed at 6 months of child age
	3.3 Parenting behaviors and parent-child relationship	Percentage of caregivers scoring above the lowest quartile on the IT-HOME subscale scores for Responsivity and Acceptance, assessed at 6 months old during time period

Construct[38]	Domains[146]	New Jersey's Definition of Improvement[146]
	3.4 Parent emotional well-being and parenting stress	Percentage of mothers screened with a standardized measure for parent emotional well-being or parenting stress
	3.5 Child communication, language, and emergent literacy	Proportion of target children on target for language development as measured by the ASQ-3 subscale Communication for child's communication, language, and emergent literacy
	3.6 Child cognitive skills	Proportion of target children on-target for cognitive skills as measured by the ASQ-3 subscale Problem Solving
	3.7 Child positive approaches to learning	Proportion of target children on-target for cognitive skills as measured by the ASQ-3 subscale Personal-Social
	3.8 Child social behavior, emotion regulation, and emotional well-being	Proportion of target children on-target for social behavior, emotion regulation, and emotional well-being as measured by the ASQ-SE
	3.9 Child physical health and development	Proportion of target children appropriately screened for physical health and development at 6 months of age
4. Reduction in crime or domestic violence	4.1 Screening for domestic violence	Rate of screenings for domestic violence
	4.2 Referrals for domestic violence services	Rate of appropriate referrals to relevant domestic violence services
	4.3 Domestic violence safety plan	Rate of completed safety plans for identified domestic violence
	4.4 Arrests	Not listed
	4.5 Convictions	Not listed
5. Improved family economic self-sufficiency	5.1 Income and benefits	Percentage of caregivers who increase total household income and benefits over time
	5.2 Employment or education	Percentage of caregivers who initiated, continued in, or completed an education program since the 6 month follow-up
	5.3 Health insurance status	Percentage of household members (child and primary enrolled adult) who have health insurance over time
6. Improved coordination and referral for other community resources and supports	6.1 Identification for necessary services	Proportion of families screened for necessary services by a standardized assessment tool
	6.2 Referrals for necessary services	Proportion of families identified as requiring a service and who received a referral to an available community resource
	6.3 Receipt of necessary services and completed referrals	Proportion of completed referrals
	6.4 Number of MOUs	Number of MOUs each home visitor agency has with a health/service agency
	6.5 Information sharing	Percentage of agencies with which each home visiting provider has a clear point of contact in the collaborating community agency that includes regular sharing of information between agencies

Appendix E: Criteria for Selection of Covariates

Table E.1: Covariates used in randomized controlled trials of Healthy Families America

Measure	Study	Significant in data	Available and valid in data
Maternal age[€]	Duggan (2004)1[b], Duggan (2004)2[b], DuMont (2008), DuMont (2010), Lee (2009), Mistry (2015), Jacobs (2016), LeCroy (2011)	≤0.001[₸]	Yes
Prenatal entry[€]	DuMont (2008), DuMont (2010)	≤0.001[ψ]	Yes
Child age	DuMont (2010), Mistry (2015), Jacobs (2016)	≤0.001[₸]	Yes
Child gender	DuMont (2010), Mistry (2015) (if child health outcome), Jacobs (2016) (if child outcome)	n/a	Yes
Measures of maternal mental health[€]	Bair-Merritt (2010), Caldera (2007), Duggan (2004)1, Duggan (2004)2, DuMont (2008), Mistry (2015), Jacobs (2016)	≤0.001[ψ]	Yes
Measures of income and public assistance[€]	Duggan (2004)1[b], Duggan (2004)2[b], DuMont (2008), DuMont (2010), Lee (2009), Mistry (2015), Jacobs (2016), LeCroy (2011)	n/a	Yes
Use of center-based parenting services	Caldera (2007)[a]	n/a	No
Access to health care coverage	Caldera (2007)[a], LeCroy (2011)	n/a	Yes
Agency/ Model/ Site	Bair-Merritt (2010), Duggan (1999)[a], Duggan (2004)1, Duggan (2004)2, DuMont (2008), Lee (2009), Jacobs (2016)[c]	n/a	Yes
Urban/Rural	Lee (2009)	n/a	No
Race/ethnicity	DuMont (2008), DuMont (2010), Lee (2009), Mistry (2015), Jacobs (2016)	0.23[ψ]	Yes
Primary language[€]	Lee (2009)	≤0.001[ψ]	Yes
Nativity	DuMont (2008), Mistry (2015), Jacobs (2016)	n/a	No
Maternal partnership[€]	Caldera (2007), DuMont (2010)	≤0.001[ψ]	Yes
Gravida	DuMont (2008), Lee (2009)	≤0.001[₸]	Yes
Parity[€]	Duggan (2004)1[b], Duggan (2004)2[b]	≤0.001[₸]	Yes

Table E.1. Covariates used in randomized controlled trials of Healthy Families America, cont.

		Current study	
Measure	**Covariate in RCT**	**Association with independent variable**	**Available and valid in data**
Educational level[€]	DuMont (2010)	≤0.001[ψ]	Yes
Current parental / household *n* employment[€]	Bair-Merritt (2010), Duggan (2004)1, Duggan (2004)2, LeCroy (2011)	≤0.001[Ŧψ]	Yes
Referral before intake		0.30	Yes
Total N other biological children	DuMont (2010)	n/a	Invalid
Substance abuse	Bair-Merritt (2010), Duggan (1999), Lee (2009)	n/a	Invalid
Measures of family violence	Bair-Merritt (2010), Duggan (1999), Duggan (2004)1, Duggan (2004)2, DuMont (2008), DuMont (2008), DuMont (2010)	n/a	Invalid
Parent abused as child	DuMont (2008), LeCroy (2011)	n/a	Invalid
Parental physical health	DuMont (2008)	n/a	No
Risk score[€]	Duggan (1999)[a], Duggan (2004)1[b], Duggan (2004)2[b], DuMont (2010)	≤0.001[Ŧ]	Yes
HOME score	Caldera (2007)[a]	n/a	Yes
Year	Duggan (2004)1, Duggan (2004)2	n/a	Yes
Residential mobility	DuMont (2010), Mistry (2015), Jacobs (2016)	n/a	No
Maternal self-efficacy	Caldera (2007)[a], DuMont (2010)	n/a	No
Parenting attitudes	DuMont (2010)	n/a	No
Received prenatal care	LeCroy (2011)	n/a	Yes

[a] tested as mediator
[b] tested as moderator
[c] included as cluster
[Ŧ] Student's t-test
[ψ] chi-square test
[λ] Spearman's test for collinearity
[€] included as covariate

Table E.2: Significance and distribution of missingness of covariates included in study

				Distribution of missingness (N)		
					TANF	
Covariates	**Values**	**Reference group**	**Statistical significance**	**Total Missing**	**Participants**	**Non-participants**
Maternal age	14-48 years	continuous	≤0.001	4	1	3
Prenatal entry	No, Yes	postnatal	≤0.001	0	-	-
Poor maternal mental health	No, Yes	not poor maternal mental health	≤0.001	0	-	-
TANF	No, Yes	not TANF	-	0	-	-
Primary language	English, Spanish/Other	English	≤0.001	16	4*	12*
Maternal partnership	No, Yes	unmarried	≤0.001	125	34	91
Parity	0, 1, 2+	No previous	≤0.001	191	46*	145*
Educational level	<HS, HS/GED, Some college, Vocational/ Associates Degree or more	<HS	≤0.001	87	30	57
Maternal employment	0, 1	no	≤0.001	97	32	65
Risk score	0-80	continuous	≤0.001	8	2	6

* p<0.001

Table E.3: Spearman's rank-order correlation coefficients for potential covariates

	Maternal age (years)	Child age (days)	Gravida	Parity	Marital Status	Educational Attainment	Family Survey Score	Household number currently employed
Maternal age (years)	1							
Child age (days)	-0.05	1						
Gravida	0.61*	0.26	1					
Parity	0.39*	0.23*	0.97*	1				
Marital Status	0.24*	-0.08*	0.11	0.06	1			
Educational Attainment	0.23*	0.04	0.21	-0.05	0.13*	1		
Family Survey Score	-0.10*	0.08*	0.12	0.13*	-0.27*	-0.12*	1	
Household number currently employed	0.08*	-0.12*	0.25	-0.06	0.14*	-0.01	-0.17*	1

* Significant at $p \leq 0.05$ or less

Appendix F: Cluster Analyses

Table F.1: Sites differ in distribution of the independent variable

Site	% TANF	Total *N* Enrolled
1	25.9	170
2	13.9	115
3	46.8	111
4	58.7	392
5	33.6	113
6	7.6	105
7	21.3	174
8	17.8	90
9	29.9	77
10	43.2	190
11	50.9	55
12	50.0	140
13	25.3	217
14	6.9	72
15	42.5	73
16	27.5	244
17	3.1	32
18	21.5	65
19	11.8	153
20	10.7	150
21	12.2	41
Total	30.8	2,779

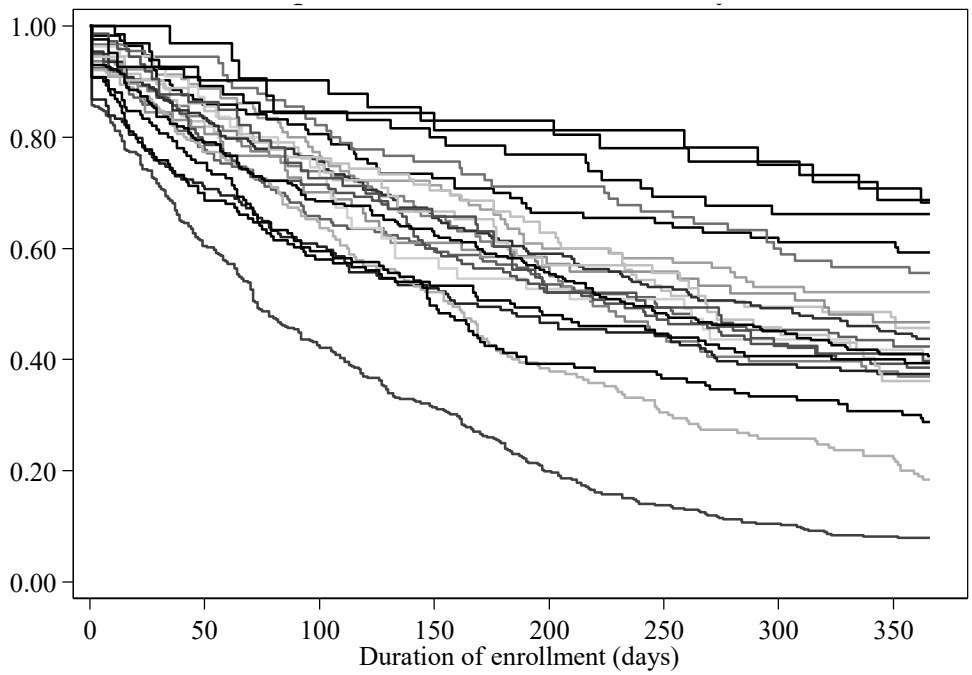
$p \leq 0.001$

Table F.2: Sites differ in distribution of the dependent variable

Mean Duration of Enrollment

	All			TANF participants			TANF non-participants		
Site	Mean	SD	*N*	Mean	SD	*N*	Mean	SD	*N*
1	212.6	144.0	170	170.3	151.7	44	227.4	138.9	126
2	243.7	132.7	115	176.6	132.3	16	254.5	130.2	99
3	215.5	132.7	111	228.4	131.0	52	204.2	134.3	59
4	111.6	109.1	392	107.1	100.1	230	118.0	120.8	162
5	259.3	132.0	113	265.8	128.0	38	256.0	134.7	75
6	235.9	134.9	105	198.9	138.6	8	238.9	134.9	97
7	188.3	148.9	174	172.1	145.0	37	192.7	150.2	137
8	265.3	123.2	90	241.3	132.0	16	270.5	121.5	74
9	224.8	144.6	77	241.2	143.5	23	217.8	145.8	54
10	173.5	126.8	190	161.4	123.3	82	182.6	129.2	108
11	217.4	135.4	55	222.0	138.1	28	212.5	135.0	27
12	212.6	138.2	140	195.4	149.1	70	229.8	125.1	70
13	229.2	136.8	217	215.7	130.2	55	233.7	139.1	162
14	227.6	133.0	72	176.6	165.6	5	231.4	131.0	67
15	223.2	132.0	73	242.0	122.7	31	209.3	138.2	42
16	215.1	140.7	244	176.4	148.7	67	229.8	135.2	177
17	296.8	110.4	32	34.0	0.0	1	305.3	101.1	31
18	278.7	121.5	65	297.6	108.7	14	273.5	125.3	51
19	175.4	142.3	153	134.9	119.6	18	180.8	144.6	135
20	194.3	147.7	150	168.4	157.6	16	197.4	146.8	134
21	294.6	114.9	41	193.2	165.4	5	308.7	101.5	36
Total	203.3	140.6	2779	175.0	136.9	856	216.0	140.4	1923

Figure F.1: Family Kaplan-Meier survival curves vary by site (n=21)



Note: Each line corresponds with survival function for one HFNJ site

Appendix G: Sensitivity Analyses

Duration of Enrollment:

Standardizing measures of enrollment and discharge is critical to understanding the impact of duration of enrollment as a predictor and outcome.[6,16,18,24,42,85,111,165,166] Most measures use the formal date of discharge from the program to approximate the end of family participation in services. The formal discharge date is not necessarily the same as the date of the final home visit. Some families are disengaged from services but remain enrolled in HV while programs conduct creative outreach efforts to re-engage them.[140] Where this occurs, the date of last visit and discharge dates may be separated by wide intervals of time.[8,9,83,140]

Sensitivity analyses found that home visiting programs continue outreach to families long after families disengage from services. Families are not formally disenrolled from programs while this outreach occurs. For this reason, home visiting programs' estimates of length of family enrollment exceeds estimates of family duration of enrollment when subtracting first visit date from final visit date. If this study were to use formal discharge dates as calculated by programs, it would overestimate family contact with programs.

The HFNJ formal discharge date:

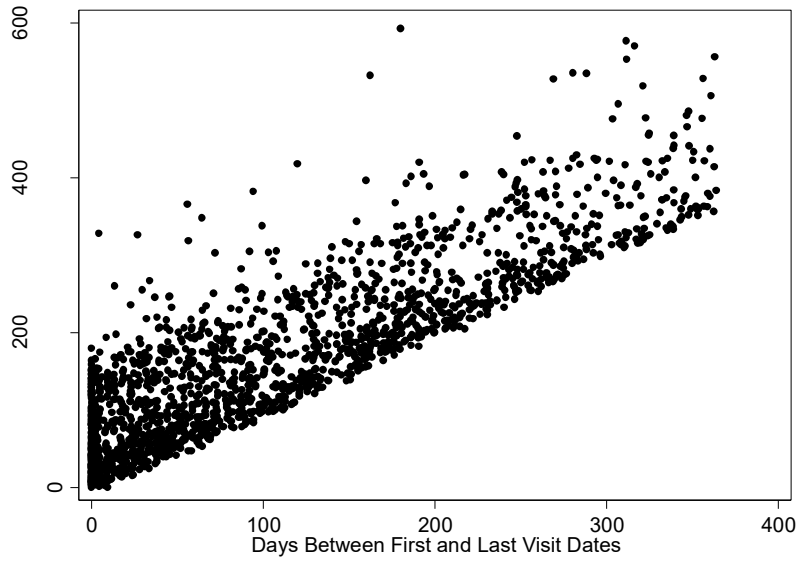
- Never underestimates the days of family engagement in HFNJ.
- Agrees with date from intake to final visit date for only roughly 64% of families.
- Overestimates days from intake to final visit date for most families.
    - > 1 year: 4.5% (n=125)
    - > 6 mos - < 1 year: 9.6% (n=266)
    - > 3 mos - < 6 mos: 12.7% (n=354)
    - < 3 mos: 8.8% (n=245)

Table G.1: Comparison of duration of enrollment measurements

Calculated by discharge date (Program method)	**Calculated by final visit date (Study method)**						
	0 days	**1 day-1mo**	**>1-<3mos**	**>3-<6mos**	**>6-<12mos**	**1yr+**	**Total**
0 days (intake only)	10	0	0	0	0	0	10
1 day - 1 month	73	49	0	0	0	0	122
>1 - <3 mos	74	98	180	0	0	0	352
>3 - <6 mos	69	81	204	218	0	0	572
>6 - <12mos	1	6	61	198	259	0	525
1 yr+	0	0	2	11	112	1073	1198
Total	227	234	447	427	371	1073	2779

* Highlighted cells indicate areas of agreement between discharge date and final visit dates

Figure G.1: Discrepancy in days enrolled: Days between formal intake and discharge dates versus days between first and last visit date



Appendix H: Missing Data and Imputation

Figure H.1: Patterns of covariate missingness

Parity	Maternal Age	Kempe Score	Maternal partnership	Current employment	Education	Primary language	*N* Missing	Families
+	+	+	+	+	+	+	0	2422
o	+	+	+	+	+	+	1	162
+	+	+	o	+	+	+	1	61
+	+	+	+	o	+	+	1	29
+	+	+	+	+	o	+	1	15
+	+	+	+	+	+	o	1	4
+	o	+	+	+	+	+	1	4
+	+	+	+	o	o	+	2	16
o	+	+	o	+	+	+	2	8
+	+	+	o	+	o	+	2	4
o	+	+	+	+	+	o	2	1
+	+	+	o	o	o	+	3	32
o	+	+	+	o	o	+	3	1
o	+	+	o	+	+	o	3	1
o	+	+	o	o	o	+	4	9
+	+	+	o	o	o	o	4	1
o	+	+	o	o	o	o	5	1
o	+	o	o	o	o	o	6	8

Table H.1: Number of covariates missing

N Missing	ALL	TANF	No TANF
0	2422	754	1668
1	275	77	198
2	29	10	19
3	34	12	22
4	10	1	9
5	1	1	1
6	8	1	6

p =0.64

Table H.2. Differences in missingness in TANF groups

	All	TANF participants	Not TANF participants	*p*
Parity	191	46	145	0.04
Maternal Age	4	1	3	0.80
Kempe Score	8	2	6	0.72
Partnership Status	125	34	91	0.37
Maternal Employment	97	32	65	0.64
Educational Attainment	87	30	57	0.45
Primary Language	16	4	12	0.61

Appendix I: Chapter 5 Additional Materials

Table I.1: Proportion of families receiving services in first three months and first year, by TANF participation

Services	Received services in first three months				Received services in first year, %			
		TANF				TANF		
	All (%) *n* = 2,779	Yes (%) *n* = 856	No (%) *n* = 1,923	*p*	All (%) n = 2,779	Yes (%) *n* = 856	No (%) *n* = 1,923	*p*
Any education content or referral								
Provide information on educational and training options	15.1	17.3	14.1	0.30	31.7	30.7	33.8	0.11
Any education referral	3.0	2.8	3.1	0.65	3.9	3.0	4.3	0.10
Adult basic education	1.7	3.7	1.1	0.07	2.2	1.7	3.7	0.21
GED preparation	7.8	11.2	6.8	0.14	12.2	10.8	16.8	0.10
Special education	0.9	0.9	0.9	0.94	1.3	1.4	0.9	0.70
College	2.4	1.9	2.6	0.68	4.4	4.8	2.8	0.37
Other educational services	10.2	9.3	10.5	0.73	20.0	21.9	14.0	0.08
Any employment content or referral								
Discuss employment and training	19.5	20.2	19.2	0.53	48.0	49.1	45.4	0.07
Provide employment information and/or help parent(s) look for job	4.3	5.3	3.9	0.10	18.6	17.9	20.1	0.17
Any employment referral	2.7	2.8	2.6	0.76	4.0	4.2	4.0	0.75
Vocational or job skills training	4.4	9.3	2.8	≤0.001	12.4	10.5	18.7	0.03
Job readiness and/or employability skills	4.6	7.5	3.7	0.10	11.8	10.8	15.0	0.24
Job search and placement assistance	17.9	26.2	15.3	0.01	41.6	38.9	50.5	0.03
Work experience	0.4	1.9	0.0	0.01	1.7	1.1	3.7	0.07
One-Stop Career Center	2.8	1.9	3.1	0.49	3.7	4.0	2.8	0.57
Any financial content or referral								
Discuss household income and/or financial literacy	17.8	16.4	18.5	0.17	44.3	46.1	40.1	≤0.001
Provide information and/or assistance on economic self-sufficiency or financial literacy	7.7	7.6	7.7	0.93	24.1	25.3	21.4	0.03
Any financial referral	0.2	0.1	0.3	0.45	2.9	3.5	2.6	0.7
Money Management	1.7	2.8	1.4	0.34	4.1	3.7	5.6	0.38

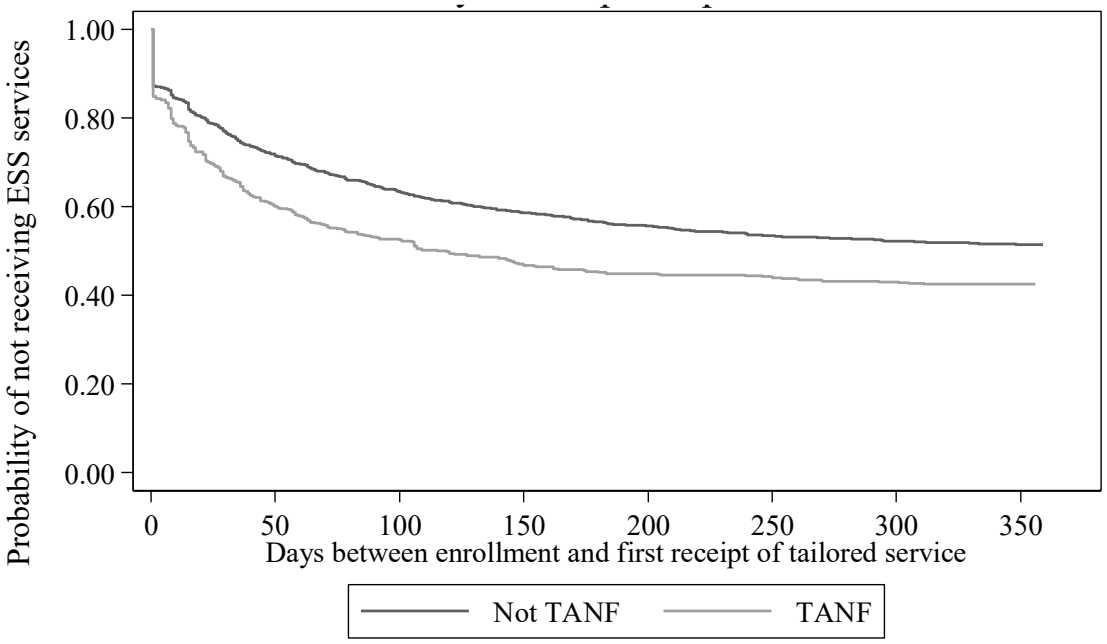
Table I.2: Mean days to first receipt of service, by TANF participation

Services	Days to first receipt, mean (SD)			
		TANF		
	All *n* = 2,779	Yes *n* = 856	No *n* = 1,923	*p*
Any Education				
Provide information on educational and training options	73.0	57.2	80.7	≤0.001
Any education referral	97.3	73.5	104.9	0.04
Adult basic education	36.3	22.8	45.3	0.53
GED preparation	83.4	66.7	91.4	0.37
Special education	70.7	0.0	84.8	0.19
College	93.7	61.7	99.4	0.47
Other educational services	101.5	76.5	106.3	0.23
Any Employment				
Discuss employment and training	103.9	94.1	107.9	0.04
Provide employment information and/or help parent(s) look for job	135.8	123.4	142.0	0.06
Any employment referral	119.7	109.2	124.1	0.34
Vocational or job skills training	142.3	115.2	157.0	0.19
Job readiness and/or employability skills	163.2	110.3	185.4	0.05
Job search and placement assistance	128.8	110.2	136.1	0.14
Work experience	190.9	180.5	201.3	0.80
One-Stop Career Center	54.5	55.3	54.4	0.99
Any Financial				
Discuss household income and/or financial literacy	99.7	87.9	104.1	0.05
Provide information and/or assistance on economic self-sufficiency or financial literacy	104.5	101.4	105.6	0.54
Any financial referral	128.5	145.0	120.8	0.58
Money Management	128.5	145.0	120.8	0.58

Table I.3: Multivariable Cox proportional hazards analysis, adjusted hazard ratios

	Any				Educational				Employment				Financial			
Predictor	**HR**	***p***	**95% CI**		**HR**	***p***	**95% CI**		**HR**	***p***	**95% CI**		**HR**	***p***	**95% CI**	
Unadjusted																
TANF	1.0	0.50	0.9	1.2	1.1	0.25	0.9	1.2	1.1	0.21	0.9	1.3	0.8	0.02	0.7	1.0
Non-English	0.8	0.00	0.7	0.9	0.8	0.00	0.7	0.9	0.7	0.00	0.5	0.8	1.0	0.96	0.8	1.2
Adjusted																
TANF	1.1	0.47	0.9	1.2	1.1	0.10	1.0	1.3	1.1	0.22	0.9	1.4	0.9	0.16	0.7	1.1
Non-English	0.8	0.00	0.7	0.9	0.7	0.00	0.6	0.9	0.8	0.02	0.6	1.0	1.0	0.97	0.8	1.2
Poor maternal mental health	1.0	0.84	0.9	1.1	1.0	0.68	0.8	1.1	0.9	0.56	0.8	1.1	1.1	0.15	1.0	1.3
Maternal age	1.0	0.21	1.0	1.0	1.0	0.00	1.0	1.0	1.0	0.79	1.0	1.0	1.0	0.01	1.0	1.0
Prenatal entry to program	0.8	0.00	0.7	0.9	0.8	0.00	0.7	0.9	0.9	0.41	0.8	1.1	0.9	0.49	0.8	1.1
Family Survey score	1.0	0.04	1.0	1.0	1.0	0.35	1.0	1.0	1.0	0.02	1.0	1.0	1.0	0.33	1.0	1.0
Current maternal employment	1.0	0.83	0.9	1.1	0.9	0.21	0.7	1.1	0.9	0.59	0.8	1.2	1.0	0.67	0.9	1.3
Parity																
0	reference															
1	1.0	0.92	0.9	1.2	1.0	1.00	0.8	1.2	0.9	0.63	0.7	1.2	0.9	0.55	0.7	1.2
≥2	1.0	0.91	0.8	1.2	0.9	0.48	0.7	1.1	1.0	0.80	0.8	1.3	1.0	0.83	0.8	1.3
Married	1.2	0.03	1.0	1.4	1.2	0.03	1.0	1.5	1.1	0.40	0.9	1.4	1.1	0.20	0.9	1.4
Educational level																
< High school graduate	reference															
High school graduate or GED	0.8	0.01	0.7	1.0	0.8	0.00	0.7	0.9	1.2	0.10	1.0	1.4	0.9	0.28	0.7	1.1
Some college	0.9	0.06	0.7	1.0	0.7	0.01	0.6	0.9	1.3	0.03	1.0	1.6	0.9	0.61	0.7	1.2
≥ Vocational school or Associate's degree	0.9	0.34	0.8	1.1	0.9	0.18	0.7	1.1	1.3	0.06	1.0	1.7	0.8	0.13	0.6	1.1
Model χ^2	53.70				100.2				32.5				20.7			
Model $p \geq \chi^2$	<0.001				<0.001				<0.001				0.10			

Figure I.1: Probability of not receiving ESS services for families enrolling in HFNJ in 2015-2015, by TANF participation



Adjusted for maternal age, poor mental health, employment, education, marital status, primary language, parity, prenatal entry, Family Survey score, and site.

Figure 5.1 depicts the probabilities of not receiving ESS services among TANF participants and non-participants in the first year of enrollment. The survival curves depicted in Figure 5.1 were restricted to the first three months of enrollment and tested for differences between TANF participants and non-participants. The log rank test found a marginal difference in the survival functions of TANF participants and non-participants in the first three months of enrollment ($p=0.06$). However, the difference in the rates of ESS receipt between TANF participants and non-participants restricted to the first three months did not persist after adjusting for covariates ($p=0.37$).

Appendix J: Chapter 6 Additional Materials

Table J.1: Comparison of incidence rates

	Total *N*	Discontinued Enrollment *N*	Discontinued Enrollment %	Person-Days at risk	Person-time Incidence Rate per 1,000 days	Difference	Ratio	Attributable Fraction (Exposed)	Attributable Fraction (Total Population)	*p*
TANF participation										
TANF participant	745	518	69.5	139,534	3.7	1.5	1.7	40.7	15.2	
TANF non-participant	1666	867	52	393,551	2.2					<0.001
Received ESS service										
Received in first three months	643	338	52.6	152,258	2.2	-0.5	0.8	19.3	5.5	
Did not receive in first three months	1768	1047	59.2	380,827	2.7					<0.001
Received ESS service, by TANF participation										
TANF participants										
Received in first three months	218	140	64.2	45,151	3.1	-0.9	0.8	22.6	7.3	<0.001
Did not receive in first three months	527	378	71.7	94,383	4.0					
TANF non-participants										
Received in first three months	113	198	57.1	107,107	1.8	-0.5	0.8	20.8	5.7	<0.001
Did not receive in first three months	77	669	11.5	286,444	2.3					

Appendix K: The Contribution of Attrition in the First Day

Additional analyses were conducted to examine survival in the first day and what influence this may have on the overall survival probabilities. Was the difference in the probability of retention at one year attributable to differences in retention at Day 1?

A variable was created for the ESS services delivered *in the first visit* to assess whether the likelihood of receiving ESS services in the first visit was comparable for families who had only one visit and families who had more than one visit. (In previous analyses, ESS service receipt in any visit in the first three months had been investigated.) Of families who received only one visit, 23.2% received ESS services in their first visit. Of families who went on to receive more than one visit, 22.8% received ESS services in their first visit. A chi-square confirmed that there was no difference in receipt of ESS services in the first visit among families who received only one visit compared to those who received more than one visit (p=0.90).

Next, factorial logistic regression tested the odds of attrition at the first visit across the four groups (by ESS/TANF, see Table K.1). The adjusted odds of receiving only one visit were significantly higher for TANF participants who did not receive ESS services when compared to TANF participants who did receive ESS services (OR 3.2, p<0.001). TANF non-participants who did not receive ESS services also had 2.8 times the odds of receiving only one visit when compared to TANF participants who received ESS services (OR 2.8, p=0.007).

Table K.1: Adjusted odds of receiving only one visit, by TANF participation and receipt of ESS services

Measure		Adjusted Odds Ratio	95% CI	p
TANF No	ESS No (n=1,241)	2.8	1.3-5.8	0.007
	ESS Yes (n=425)	1.3	0.6-3.1	0.53
TANF Yes	ESS No (n=527)	3.2	1.6-6.7	0.001
	ESS Yes (n=218)	reference		
Other significant covariates: parity ≥2 children (OR 1.7, p=0.05) and primary language non-English (OR 0.50, p=0.001)				

The sample was restricted to those who received more than one visit (were enrolled for more than one day). Ten percent (n=71) of TANF participants received only one visit, while 7% (n=110) of TANF non-participants received only one visit. Cox proportional hazards regression models were run after excluding families who received only one visit.

The risk of attrition, when excluding families who received only one visit, remained similar among TANF non-participants. TANF non-participants who received ESS services showed, as before, a decreased risk of attrition when compared to TANF non-participants who did not receive ESS services (HR 0.85, p=0.02). When including all families, a 23% decrease in risk was associated with ESS service receipt; when restricting to families who received at least two visits, the decrease in risk was 15%.

Previous analyses including all families found a 20% decrease in the risk of attrition for TANF participants associated with ESS service receipt (HR 0.80, p=0.03). The significance of the association between ESS service receipt and decreased risk of attrition in TANF participants disappeared when removing those who received only one visit (p=0.22). For TANF participants, risk of attrition was not significantly associated with ESS service receipt after the first visit.

In summary, families who received only one visit and families who continued their enrollment were equally likely to have received ESS services in their first visit. Both TANF participants and non-participants who did not receive ESS services in the first visit had increased odds of receiving only one visit. Among TANF non-participants who received at least two visits, the observed decreased probabilities of retention in services associated with ESS service receipt were not attributable to retention in the first day alone. The decreased risk of attrition associated with ESS service receipt in TANF non-participants persisted even after restricting the sample to families who remained in services for at least two visits. Among TANF participants

who received at least two visits, there was no decreased risk of attrition associated with ESS service receipt among TANF participants after the first day of enrollment.

Table K.2: Adjusted risk of attrition for full sample and sample stratified by TANF participation including families who received only one visit

	Full sample			TANF participants			TANF non-participants		
	HR	**95% CI**	***p***	**HR**	**95% CI**	***p***	**HR**	**95% CI**	***p***
TANF participation	1.10	0.69-1.75	0.70						
Received ESS services in first three months	0.79	0.70-0.90	<0.001	0.80	0.66-0.99	0.03	0.77	0.65-0.90	<0.001
Poor maternal mental health	0.92	0.82-1.03	0.15	0.82	0.68-1.00	0.05	0.94	0.82-1.10	0.49
Maternal age									
<18									
18-24	0.92	0.58-1.44	0.71	0.58	0.32-1.04	0.07	1.09	0.81-1.47	0.57
25-34	0.68	0.34-1.37	0.29	0.46	0.25-0.84	0.01	0.86	0.63-1.18	0.36
≥35	0.46	0.17-1.29	0.14	0.32	0.16-0.65	0.002	0.65	0.45-0.93	0.02
Prenatal entry to program	0.83	0.73-0.93	0.002	0.62	0.48-0.81	<0.001	0.89	0.77-1.03	0.12
Family Survey score	1.00	0.99-1.00	0.61	1.00	0.99-1.01	0.84	1.00	0.99-1.00	0.42
Current maternal employment	1.08	0.92-1.25	0.34	0.74	0.47-1.15	0.18	1.12	0.95-1.31	0.18
Primarily non-English speaking	0.61	0.53-0.71	<0.001	0.84	0.60-1.18	0.32	0.58	0.49-0.69	<0.001
Parity									
0									
1	0.96	0.80-1.14	0.62	0.82	0.41-1.65	0.58	1.00	0.82-1.21	0.98
≥2	1.04	0.87-1.26	0.65	0.90	0.45-1.81	0.77	1.08	0.88-1.33	0.44
Married	0.89	0.75-1.05	0.17	1.07	0.71-1.67	0.75	0.86	0.71-1.04	0.12
Educational level									
< High school graduate									
High school graduate or GED	0.96	0.84-1.10	0.53	0.98	0.79-1.22	0.87	0.95	0.79-1.13	0.53
Some college	0.99	0.83-1.17	0.87	0.99	0.76-1.30	0.96	1.00	0.80-1.24	0.98
≥ Vocational school or Associate's degree	0.84	0.70-1.03	0.09	0.87	0.61-1.22	0.41	0.84	0.67-1.06	0.14
Model $p>\chi^2$			*p*<0.001						

Table K.3: Adjusted risk of attrition for full sample and sample stratified by TANF participation after restricting to families who received more than one visit

	Full sample			TANF participants			TANF non-participants		
	HR	**95% CI**	***p***	**HR**	**95% CI**	***p***	**HR**	**95% CI**	***p***
TANF participation	1.33	0.79-2.24	0.28	n/a			n/a		
Received ESS services in first three months	0.85	0.74-0.97	0.02	0.88	0.71-1.08	0.22	0.81	0.69-0.97	0.02
Poor maternal mental health	0.94	0.83-1.07	0.38	0.88	0.71-1.08	0.21	0.96	0.82-1.13	0.63
Maternal age									
<18	ref								
18-24	0.78	0.47-1.23	0.33	0.46	0.23-0.90	0.24	1.09	0.79-1.51	0.59
25-34	0.51	0.24-1.10	0.09	0.33	0.17-0.67	0.002	0.88	0.63-1.24	0.46
≥35	0.31	0.10-0.95	0.04	0.24	0.11-0.56	<0.001	0.64	0.43-0.95	0.03
Prenatal entry to program	0.79	0.70-0.90	<0.001	0.59	0.45-0.79	<0.001	0.87	0.74-1.01	0.08
Family Survey score	1.00	0.99-1.00	0.32	1.00	0.99-1.01	0.92	1.00	0.99-1.00	0.28
Current maternal employment	1.09	0.92-1.29	0.32	0.71	0.42-1.17	0.18	1.13	0.95-1.35	0.17
Primarily non-English speaking	0.62	0.53-0.73	<0.001	0.95	0.66-1.37	0.78	0.58	0.49-0.70	<0.001
Parity									
0	ref								
1	0.94	0.77-1.13	0.50	0.88	0.40-2.00	0.76	0.98	0.80-1.21	0.87
≥2	0.96	0.79-1.18	0.72	0.88	0.39-1.97	0.75	1.03	0.83-1.28	0.78
Married	0.86	0.72-1.04	0.12	1.02	0.65-1.61	0.92	0.83	0.68-1.02	0.08
Educational level									
< High school graduate	ref								
High school graduate or GED	1.00	0.86-1.16	0.99	1.05	0.83-1.32	0.70	0.97	0.80-1.17	0.74
Some college	0.96	0.80-1.15	0.66	0.97	0.73-1.31	0.86	0.98	0.77-1.24	0.86
≥ Vocational school or Associate's degree	0.82	0.66-1.01	0.07	0.86	0.59-1.27	0.46	0.82	0.64-1.05	0.12
Model $p>\chi^2$			<0.001			<0.001			<0.001

Appendix L: Institutional Review Board Determination

FWA#00000287

Institutional Review Board Office

615 N. Wolfe Street / Room E1100
Baltimore, Maryland 21205-2179
Phone: 410-955-3193
Toll Free: 1-888-262-3242
Fax: 410-502-0584
Email: jhsph.irboffice@jhu.edu
Website: www.jhsph.edu/irb

NOT HUMAN SUBJECTS RESEARCH

DETERMINATION NOTICE

STUDENT PROJECTS

Date: July 26, 2017

To: Amanda Gatewood

Re: **PhD Dissertation Student Project Title:** "Service Tailoring and Duration of Enrollment in Maternal and Early Childhood Home Visiting Programs"

The JHSPH IRB reviewed the IRB Office Determination Request Form for Secondary Data Analysis (received July 19, 2017) on **July 26, 2017**. We have determined that the proposed activity described in your request form will involve secondary analysis of existing, de-identified data set from the Healthy Families New Jersey Management Information System with three objectives: (1) to assess the relationship between characteristics of families newly enrolling in home visiting and their duration of enrollment in services, (2) to determine the extent to which home visitors tailor services in the first three months of family enrollment to address economic and mental health risks; and 3) to determine whether early tailoring of services to address economic and mental health risks is associated with duration of family enrollment. Thus, the proposed activity does not qualify as human subjects research as defined by DHHS regulations 45 CFR 46.102, and does not require IRB oversight.

You are responsible for notifying the JHSPH IRB of any future changes that might involve human subjects and require IRB review.

If you have any questions regarding this determination, please contact the JHSPH IRB Office at (410) 955-3193 or via email at jhsph.irboffice@jhu.edu.

/teb

Cc Anne Duggan, ScD Faculty Advisor / Professor
Department of Population, Family and Reproductive Health
Johns Hopkins University Bloomberg School of Public Health

Appendix M: Curriculum Vitae

April 11, 2018

CURRICULUM VITAE

Amanda K. Gatewood, MPH

PART I

PERSONAL DATA

615 N. Wolfe Street, E4139
Baltimore, MD 21205
410-502-9117
akgatewood@jhu.edu

EDUCATION AND TRAINING

2018 (expected)	Ph.D., Johns Hopkins Bloomberg School of Public Health Dissertation: "Tailoring Services to Promote Economic Self-Sufficiency and Continued Enrollment in Maternal and Early Childhood Home Visiting Programs" Advisors: Anne K. Duggan, Sc.D. and Cynthia Minkovitz, MD
2010	Master of Public Health, University of California Berkeley
2006	Bachelor of Arts, English, University of Kentucky

PROFESSIONAL EXPERIENCE

9/2015 – present	Senior Research Program Coordinator II, Department of Population, Family, & Reproductive Health, Johns Hopkins Bloomberg School of Public Health
5/2015 – 9/2015	Needs Assessment Consultant, Maryland Department for Health and Mental Hygiene, Health Resources and Services Administration Trainee Fellowship
9/2013 – 5/2015	Graduate Research Assistant, Johns Hopkins Bloomberg School of Public Health, MIHOPE, Maryland MIECHV, and National MIECHV Home Visiting Evaluations (Primary Investigator: Dr. Anne Duggan)
9/2012 – 7/2013	Fulbright Student Scholar to Kyrgyz Republic, U.S. Department of State and Institute of International Education
2/2011 – 6/2012	Epidemiologist, Kentucky Department for Public Health, Division of Maternal and Child Health, Early Childhood Development Branch (Programs Served: Kentucky Birth Surveillance Registry, Newborn Screening Program, Statewide Home Visiting Program, and Early Intervention Program)
7/2010 – 8/2011	Doula, freelance
10/2008 – 8/2010	Graduate Research Assistant, University of California Berkeley School of Public Health (Primary Investigator: Dr. Sylvia Guendelman)
5/2009-11/2009	Program Development Consultancy, Berkeley Youth Alternatives

2/2009 – 5/2009	Community Based Participatory Research Analyst, Berkeley Technology Academy Alternative School
9/2008 – 5/2009	Needs Assessment Consultant, Brighter Beginnings, Berkeley, CA
11/2007 – 7/2008	Program Developer, Protect the Earth – Protect Yourself Cambodia
7/2007 – 9/2007	Research Team Staff and Translator, The Earthwatch Institute, Shaanxi, China

PROFESSIONAL ACTIVITIES

Member, Maryland Public Health Association

Member, Society for Research in Child Development

Member, Kentucky Substance Exposed Newborns Working Group

EDITORIAL ACTIVITIES

Peer reviewer, *Addictive Behaviors*

PUBLICATIONS

Journal articles

West A, **Gatewood AK**, Higman SM, Duggan AK. Addressing Maternal Substance Use in Early Childhood Home Visiting: the Impact of Program Expectations and Supports on Visitor Communication Skills. In development. 2018.

West A, Gagliardi L, **Gatewood AK**, Higman S, Daniels J, O'Neill KMG, Duggan AK. Randomized Trial of a Training Program to Improve Home Visitor Communication around Sensitive Topics. *Matern Child Health J*. Maternal, Infant, and Early Childhood Home Visiting Special Issue. In press 2018.

Gatewood AK, Van Wert MJ, Andrada AP, Pamela J. Academic physicians' and medical students' perceived barriers toward bystander administered naloxone as an overdose prevention strategy. *Addict Behav*. 2016;61:40-46. doi:10.1016/j.addbeh.2016.05.013.

Reports

Gatewood AK. Preliminary Findings from the Randomized Control Trial of the Home Visitor Training Certificate Program. *HV Connect: Maryland's Home Visit Newsletter*. Maryland Department of Health. October 2017.

Contributor. Kentucky Department for Public Health. State Health Assessment: A Compilation on Health Status. Cabinet for Health and Family Services, 2013. Available at chfs.ky.gov.

Primary author. Maternal and Child Health Division Data Briefs: 1) *Anencephaly;* 2) *Spina Bifida;* 3) *Gastroschisis;* 4) *Encephalocele;* 5) *Down Syndrome.* Kentucky Birth Surveillance Registry. Cabinet for Health and Family Services, Division of Maternal and Child Health. Frankfort, Kentucky, USA; 2011.

Manuscripts in Preparation

Gatewood AK. Participation in Temporary Assistance for Needy Families and Continued Enrollment in Home Visiting. Pre-publication. 2018. Dissertation manuscript.

Gatewood AK. Tailoring Services to Families Co-Enrolled in Home Visiting and Temporary Assistance to Needy Families. Pre-publication. 2018. Dissertation manuscript.

Gatewood AK. Association of Temporary Assistance for Needy Families Participation and Receipt of Economic Self-Sufficiency Services with Duration of Enrollment in Home Visiting. Pre-publication. 2018. Dissertation manuscript.

HONORS AND AWARDS

Johns Hopkins Bloomberg School of Public Health
Bernard and Jane Guyer Scholarship, 2017
John and Alice Chenoweth-Pate Fellowship, 2014 & 2016
Donald A. Cornely Fund, 2015
Fellowship in Family Planning and Reproductive Health, 2014

Health Resources and Services Administration Trainee Fellow
Maryland Department of Health, Family and Community Health Division, 2015

Maternal and Child Health Training Grant, Health Resources and Services Administration
University of California Berkeley, 2008-2010, Director Sylvia Guendelman
Johns Hopkins School of Public Health, 2013-2015, Director Donna Strobino

Fulbright Student Scholar, Kyrgyz Republic, 2012

CERTIFICATIONS

Johns Hopkins University, 2018
Certificate Program in Population and Health
Certificate Program in Maternal and Child Health
Teaching Institute Certificate

Interviewer, Adult Attachment Interview, by Helen Deane Dozier, 2016-2018

Motivational Interviewing and Motivational Interviewing Treatment Integrity Scale, Motivational Interviewing Network of Trainers member Denise Ernst, Ph.D., 2016

Certified in Public Health (CPH), National Board of Public Health Examiners, 2010

RESEARCH GRANT PARTICIPATION

Sponsoring Agency:	Department of Health and Human Services Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Expansion Grant
Title:	Maryland's Home Visiting and Child Welfare Workforces: A Formative Study of Staff Communication and Coordination Practices to Support Substance-Exposed Newborns and Their Families
Participating Dates:	1/1/2018-present
Principal Investigator:	Dr. Allison West
Objective:	To improve the communication and coordination of family support workers across home visiting and social welfare to promote health for infants exposed to substances in utero.
Role:	Senior Research Coordinator

Sponsoring Agency:	Heising-Simons Foundation
Title:	Development of an Observational Measure of Home Visiting
Participating Dates:	7/15/2016-present
Principal Investigator:	Dr. Anne K. Duggan
Objective:	To improve the impact of home visiting on family health and functioning by investigating the program expectations of staff, program infrastructure, and communication strategies employed in visits.
Role:	Senior Research Coordinator

Sponsoring Agency:	Department of Health and Human Services Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program Grant
Title:	Maryland's Home Visiting Program: (1) Analytic Study of Current Implementation System; and (2) Randomized Trial of an Enhancement to Build Staff Communication Skills
Participating Dates:	7/7/2016-present
Principal Investigator:	Dr. Anne K. Duggan
Objective:	To improve the impact of home visiting on family health and functioning by assessing the current implementation system and evaluating uptake of a communications certificate program for home visiting staff.
Role:	Senior Research Coordinator

Sponsoring Agency:	U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research and Evaluation
Title:	Mother and Infant Home Visiting Program Evaluation (MIHOPE) National Evaluation
Participating Dates:	9/10/15-9/30/17
Principal Investigator:	Dr. Anne K. Duggan
Objective:	To (1) describe the services received by families in MIECHV-funded home visiting programs, (2) identify factors that help explain observed variation in service delivery for families; and (3) explore home visiting program staff members' perspectives on the reasons for variation in services to families in the legislatively mandated evaluation of the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program.
Role:	Senior Research Coordinator

Sponsoring Agency:	Department of Health and Human Services
Title:	Evaluation of Maryland Maternal Infant and Early Childhood Home Visiting Program D89MC26357
Participating Dates:	9/1/15-9/30/17
Principal Investigator:	Dr. Anne K. Duggan
Objective:	To increase the availability, use, and impact of home visiting in improving outcomes and reducing health and developmental disparities of at-risk expectant families and families with young children.
Role:	Senior Research Coordinator

Sponsoring Agency:	U.S. Department of State and Institute for International Education
Title:	Fulbright Student Research Award
Participating Dates:	7/15/12-8/15/13
Principal Investigator:	Amanda K. Gatewood, MPH
Objective:	To identify areas for intervention to prevent malnutrition, stunting, and wasting, and to improve infant feeding knowledge, attitudes, and practices in Uzbek enclaves of the Kyrgyz Republic.
Role:	Principal Investigator

Sponsoring Agency:	Department of Health and Human Services
Title:	Commonwealth of Kentucky Home Visiting Mother, Infant, and Early Childhood Home Visiting (MIECHV) Evaluation
Participating Dates:	5/01/2011-6/1/2012
Principal Investigator:	Dr. Ruth Ann Shepherd
Objective:	To adapt the HANDS home visiting program to the Healthy Families America model and standardize state home visiting benchmarks for national reporting.
Role:	Epidemiologist

CURRICULUM VITAE

Amanda K. Gatewood, MPH

PART II

TEACHING

Advising

Summer 2017 - Spring 2018	**Undergraduate Thesis Committee**, Political Science Johns Hopkins University
Fall 2011	**Master's in Public Health Student Preceptor** Kentucky Department for Public Health

Classroom Instruction

Spring 2017	**Teaching Assistant,** Johns Hopkins Bloomberg School of Public Health Applications in Program Monitoring and Evaluation (Principal Instructors: Dr. Sarah Crowne and Dr. Anne Palaia)
Fall 2014 & Spring 2015	**Teaching Assistant,** Johns Hopkins Bloomberg School of Public Health Lessons in Leadership (Principal Instructor: Dr. Robert Blum)
Summer 2014	**Faculty**, Morehead State University Governor's Scholars Program Health Research Topics and Methods Understanding the Kyriarchy: Inequality in Society
Spring 2014	**Guest Discussant,** Johns Hopkins Bloomberg School of Public Health Life Course Perspectives on Health (Principal Instructors: Dr. Robert Blum and Dr. Mary Elizabeth Hughes)
Spring 2014	**Teaching Assistant,** Johns Hopkins Bloomberg School of Public Health Maternal and Child Health Legislation and Programs (Principal Instructor: Dr. Cynthia Minkovitz)
Fall 2012 & Spring 2013	**English Teacher,** Community-Based Tourism Association, Kyrgyzstan Oral English Fluency for Client Satisfaction and Economic Development
Spring 2012	**Guest Lecturer,** Our Lady of Mercy Academy Health Literacy and Promotion (Principal Instructor: Amy Eisenback)
Fall 2009	**Graduate Student Instructor**, University of California Berkeley 210C: Assessing Health Needs (Principal Instructor: Dr. Sylvia Guendelman)
Fall 2006 & Spring 2007	**English Teacher,** Agricultural Middle and High School English as a Second Language, Oral English Fluency

ACADEMIC SERVICE

Doctoral Admissions Committee, Johns Hopkins Bloomberg School of Public Health, Department of Population, Family, and Reproductive Health, 2015-2016

Admissions Liaison, Johns Hopkins Bloomberg School of Public Health, 2016-2018

Master of Public Health Admissions Committee, University of California Berkeley, Maternal and Child Health Program, 2010-2011

PRESENTATIONS

Presentations

1. **Gatewood AK.** Using Survival Analysis with Secondary Administrative Data. Submitted. Conference on the Use of Secondary and Open Source Data in Developmental Science. Submitted. Phoenix, AZ, USA: Society for Research in Child Development; October 4-6, 2018.

2. West A, **Gatewood AK**, Higman S, Duggan AK. Communication as a Core Element of Home Visiting: Program and Visitor Expectations and Observed Skills in Addressing Sensitive Topics. In preparation. Invited presentation at the National Research Conference on Early Childhood. Arlington, VA, USA: Administration for Children and Families; June 26, 2018.

3. **Gatewood AK**. Maryland's Home Visitor Communication Certificate Program: Evaluation Results and Next Steps. Invited presentation at the Maryland Home Visiting Consortium. Baltimore, Maryland, USA: Maryland Department for Health; October 10, 2017.

4. **Gatewood AK**, Gagliardi L. Plenary: Lessons Learned from Maryland's Home Visitor Communication Certificate Program: Impact on Attitudes and Communication Skills. Presented at: 2017 Maternal Infant and Early Childhood Home Visiting Conference. McHenry, MD, USA: Maryland Department of Health and Mental Hygiene; September 19, 2017.

5. DiClemente CC, Gagliardi L, **Gatewood AK**, Schulz D. Maryland's Training Certificate Program: Does it Enhance Home Visitor Communication Skills? Presented at: Advancing Our Story: 2nd Annual MIECHV State, Territory, and Tribal Home Visiting Conference. Washington, D.C.: Administration for Children and Families and Health Resources and Services Administration; September 6, 2017.

6. **Gatewood AK**. Communicating About Sensitive Issues. Online presentation. Johns Hopkins School of Public Health, Department of Population, Family, and Reproductive Health, Home Visiting Research Team. Baltimore, MD, USA; July 15, 2017. Available at: https://youtu.be/EHCE58CC02I.

7. Sparr M, **Gatewood A**, Korfmacher J. The Power of Observation: Recognizing and Facilitating Parent Engagement During Home Visits. Presented at: Zero to Three National Conference, National Center for Infants, Toddlers, and Families. Seattle, Washington, USA: December 3, 2016. Available at: http://bit.ly/2hNLQoc.

8. Van Wert MJ, **Gatewood AK**. Perceived barriers to prescribing naloxone to third parties as an overdose prevention strategy: A qualitative study of physician, medical educator, and medical student attitudes. Presented at: Tenth National Harm Reduction Conference, Harm Reduction Coalition. Baltimore, Maryland, USA: October 23, 2014.

9. **Gatewood AK**. Kentucky Birth Surveillance Registry: Findings from the 10 Year Report of Birth Anomalies in Kentucky. Invited presentation at the Substance Exposed Infants Working Group. Frankfort, Kentucky, USA: Kentucky Department for Public Health; 2011.

Trainings and Facilitation

1. **Gatewood AK**. Discussion facilitator. Social Determinants of Health Symposium: Baltimore's Youth – Reducing Vulnerability to Improve Our Future. Baltimore, MD, USA: Urban Health Institute, Department of Population, Family, and Reproductive Health, Johns Hopkins Bloomberg School of Public Health; April 3, 2017.
2. **Gatewood AK.** Lead trainer. Motivational Interviewing and the Motivational Interviewing Treatment Integrity Scale Training series. Baltimore, MD, USA: Johns Hopkins Bloomberg School of Public Health, Department of Population, Family, and Reproductive Health, Home Visiting Research Team. 2016-2017.
3. Blum RW, **Gatewood AK**. Facilitator and presenter. Leadership Development for Community Organizations. Community workshop. Baltimore, MD, USA: Johns Hopkins Bloomberg School of Public Health, Department of Population, Family, and Reproductive Health; 2014.

ADDITIONAL INFORMATION

Research and Teaching Interests

- Maternal, infant, and early childhood home visiting services evaluation and research
- Interventions to promote maternal and child health service quality
- Implementation and dissemination research
- Mixed methods research, especially using administrative, observational, and qualitative data
- Innovative dissemination of research to inform policy decisions

Statistical Skills

- Statistical expertise: Multi-level modeling, survival analysis, cluster analyses, spatial analyses, mixed methods modeling
- Statistical software: SAS, Stata, SPSS, ArcGIS, NVivo
- Experience combining hospital discharge records, vital statistics data, and statewide program administrative data for morbidity and mortality surveillance